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BETTER FRUIT

VOLUME VII

MAY, 1913

NUMBER 11



TRUSTEES OF THE NORTH PACIFIC FRUIT DISTRIBUTORS

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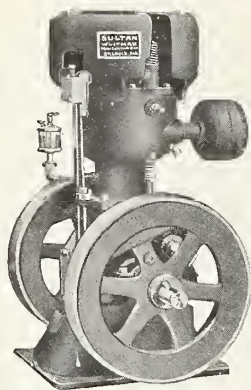
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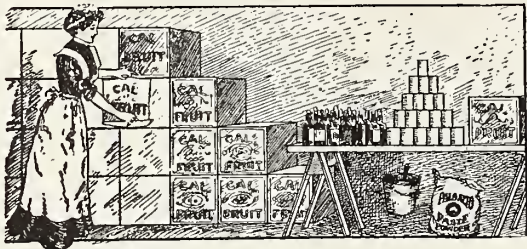
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Home Manufacture of Cider Vinegar

By Dr. L. L. Van Slyke, Geneva, New York

NEW YORK STATE has been identified in a prominent way with apple growing and with apple products for a longer period of time, probably, than any other state. In the portion of the state in which I live apple orchards were flourishing over a century ago under the cultivation of the Indians. In the orchard of one of our most prominent apple growers the owner pointed out to me last year a still vigorous tree in his orchard which was known to be more than 100 years old.

As an essential part of the apple-growing industry, there has grown up the home-making of cider and cider vinegar. For this product there has always been, and there will always be, a demand which will outrun the available supply. This demand can be supplied only in part by the product of commercial vinegar factories, conducted on a large scale. The rest must come from the farmer. Vinegar factories are of comparatively recent origin, while apple growers have always been vinegar makers. Unfortunately, they have made vinegar too much after the manner in which dairymen have made butter, in a haphazard way, without knowing just what they were doing or why they did it, and never knowing just how they were coming out. When they made a good product they called it good luck, which it really was, and were properly thankful. When they had bad luck they attributed it to an unkind providence. The old way was "hit or miss," "going it blind," with absolutely no knowledge in regard to the "what's" or the "why's" of the process, and consequently with frequent failure.

Owing to the frequent lack of success in making vinegar among our apple growers there arose a desire that a study should be made of the methods of cider-vinegar making under farm conditions, with the special object of learning why failures occur and how they may be obviated; in other words, how farmers could make good cider vinegar. An investigation was undertaken at the New York Experiment Station at Geneva covering a period of seven or eight years. Some of the results of this work as well as of work done elsewhere it is proposed to submit to your consideration at this time. The process of vinegar making is not one of extreme simplicity; it is really somewhat complicated and involves several agencies, which must be controlled with considerable care if a good product is to be obtained. It would be possible to give in a few minutes a

recipe for making cider vinegar, which would tell simply what to do and without why; but it is desirable to know something more than mere method if one is to have a really intelligent understanding of the process. A satisfactory knowledge of making cider vinegar involves the following points: (1) The composition of apple juice; (2) the changes that take place in convert-

tion of letting the apples rot on the ground at a total loss, except for their slight fertilizing value, or of making them into cider or cider vinegar.

Stated in the briefest possible form, the process of vinegar making from apple juice or "sweet cider" consists of two distinct changes or stages. In the first change the sugars of the apple juice are converted into alcohol, and the product at this stage is commonly known as "hard" cider or simply cider. In the second stage of vinegar making the alcohol of the cider is changed into acetic acid, the product then being known as vinegar. Three substances, therefore, are prominent in the process of vinegar making: (1) Apple-juice sugar, (2) alcohol and (3) acetic acid; and it is about these three materials that our discussion must largely center.

Before considering the changes produced in apple juice during its conversion into vinegar it is desirable to know something of the composition of the juice as it comes freshly prepared from apples. Apple juice contains a good many different constituents, but they are not all of equal interest to a vinegar maker; in fact there is only one class of compounds of pre-eminent importance in this connection, the sugars, and they are so because they really constitute the raw material from which the acid or vinegar is produced, as well as other desirable flavors. I have used the words "sugars," and not sugar, for a good reason, as there are at least three different substances in apple juice, each of which is chemically known as a sugar. One of these is known as sucrose or saccharose, and is simply the kind of sugar that is most familiar to us in our daily diet, the sugar that comes from sugar cane or from sugar beets. The chemical names for the two other sugars are dextrose or dextro-glucose and levulose. Dextro-glucose is familiar to us under the more common name of grape-sugar, while we often speak of levulose under the more familiar name of fruit-sugar. It is not necessary to consider on this occasion the chemical differences of these three kinds of sugars. For our purpose it is sufficient to consider the amounts of sugars in apple juice and some of the conditions under which the amounts vary. The cane-sugar in apple juice is less in amount than the grape and fruit-sugar, varying all the way from 1 to 7 per cent and averaging about 3.50 per cent. The two other sugars run from about 4.50 to 10.50 per cent and average about 7.50 per cent. Or, taking all the sugars of apple juice, the amount varies generally from 7 to

Features of this Issue

- HOME MANUFACTURE OF CIDER VINEGAR
- FRUIT CANNING—METHODS FOLLOWED IN COMMERCIAL CANNING
- ORCHARD BY-PRODUCTS—CONDITIONS AND POSSIBILITIES.
- CIDER AND VINEGAR PLANTS, CANNERIES AND EVAPORATORS
- HORTICULTURAL BY-PRODUCTS
- HOW A FRUIT CANNERY IS SUCCESSFULLY OPERATED
- A CO-OPERATIVE CANNERY—WHAT IT IS DOING
- COMMERCIAL VALUE OF UNFERMENTED FRUIT JUICES

ing apple juice into vinegar; (3) the agents that produce these changes and the conditions most suitable for their normal working; (4) abnormal agents and conditions that interfere with the making of vinegar from apple juice, and (5) practical home-making of cider vinegar. There are several interesting points connected with the general subject of vinegar which we might discuss, but which are of minor interest in their bearing on the home-making of vinegar, such as the uses of vinegar, its adulterations with methods of detection, different kinds of commercial vinegars, commercial methods of manufacture, characteristics of commercial vinegars, statistics, etc.

Before taking up the composition of apple juice we will touch briefly upon the general relation of apple growing to vinegar making.

There is always a considerable percentage of the apple crop that cannot be disposed of in the form of marketable apples, or even as dried apples, though I have seen dried products which looked as if nothing in the whole apple orchard had been omitted—skins, cores, stems, leaves and dirt. The amount of such apples depends on a variety of conditions, but mostly upon the yield of apples. The larger the yield the larger the amount of poor apples. It comes practically to a ques-

15 per cent and averages about 10 per cent.

One is at once struck with these wide variations and the question suggests itself, why do such large differences exist? The observed variations in the amount of sugar are dependent upon a variety of conditions, among which the following may be mentioned as the most prominent: (1) Variety of apples; (2) stage of ripeness; (3) soil; (4) climate; (5) culture, and (6) extent of pressing. We will stop to consider in further detail only the first two of these influences. In the case of our 100 analyses of apple juices from apples grown in the Eastern States the smallest amount of sugars (6.74 per cent) was found in Ben Davis juice and the largest amount in Baldwin (15.39). In general, it may be said that early apples average somewhat less in sugars than do winter apples. Crabapples and cider apples usually run lower in sugars than the standard varieties most commonly grown. It was a distinct disappointment that the Ben Davis juice made such a disreputable showing in sugars, because in New York this apple has no other quality to redeem it, whatever you may succeed in doing in Missouri to give it a good name and character.

In very unripe apples we have little sugar but much starch, the starch changing into sugars as the fruit ripens. For example, a Baldwin on August 7, when very green, contained 8 per cent of sugar; five weeks later (September 13), when still quite green, it contained 10.72 per cent. Two months later (November 15), when ripe, it contained 14.87 per cent. The sugars are present in largest amounts only when apples are ripe, and it is important to know that the amount decreases when apples are allowed to become overripe, and, of course, much more so when apples rot. Therefore, green apples and partly decayed apples contain smaller amounts of sugars and produce less acid in being made into vinegars than apples that are at the proper stage of ripeness. It is a matter of interest to notice, in passing, that sweet apples are not necessarily richer in sugars than sour apples. The increase of sweetness that is apparent to the sense of taste is due more to the fact that sweet apples contain less acid than sour apples. The acid that is characteristic of apples is known as malic acid. To illustrate the preceding statement, a sample of Red Astrachan juice was found to contain 10.16 per cent of sugars and 1.15 per cent of malic acid; while Tolman Sweet and Sweet Bough contain about the same amount of sugar, but only 0.10 or 0.20 per cent of malic acid, that is about one-sixth to one-twelfth the amount of acid contained in the sour Red Astrachan.

The statement was made a moment ago that green apples contain considerable amounts of starch. This has a practical bearing on vinegar making for this reason: the presence of starch in apple juice, as in the case of green apple juice, is apt to cause it to be turbid and slimy, and makes the juice

very unsatisfactory for vinegar making. In the case of really ripe apples the starch has all disappeared, having been converted into sugars. There is one other point of practical interest in connection with the composition of apple juice and its relation to vinegar making—the constituents that are responsible for the color of vinegar. It is the tannin or tannic acid of apples which is largely the factor or substance whose presence affects the color of vinegar. This is the substance which makes a puckering sensation in the mouth with a more or less pronounced bitter taste. It is strongly noticeable in unripe apples, also in crabapples. When we cut an apple the cut surface more or less quickly darkens in color, varying in time and intensity according to the amount of tannin present in the apple, that is, according to the variety of apple, stage of ripeness, etc. Apples, as well as many other fruits, contain a peculiar ferment, which acts upon tannin in the presence of the oxygen of the air, changing the tannin into a dark-colored compound. Right in this connection there is another interesting fact, that in apple juice containing considerable proportions of malic acid the tannic acid does not darken as much as in the case of juice containing less acid. This may often be observed in case of sweet apples. In the case of too much tannin, as in unripe apples, the juice becomes too dark in spite of the malic acid and produces a vinegar with unattractive color.

Before taking up the study of the fermentation processes by which apple juice is changed into vinegar we will briefly consider the conditions that affect the yield of apple juice. They are: (1) Variety of apples; (2) ripeness; (3) degree of pressure applied. In the French cider industry they expect that an apple shall yield 55 per cent of its own weight in juice. In experiments at the Virginia Experiment Station the highest amount of juice obtained with an eighty-ton hydraulic press was 70 per cent of the weight of the apples. Ripe apples contain from 82 to 88 per cent of water, and a larger proportion of this is obtainable as juice in the ordinary methods of pressing used. We can put the yield of apple juice as three to four gallons for a bushel of apples. There has been a more or less extensive practice in treating pressed pomace with some cold or warm water, allowing it to stand some hours and pressing a second time. Such "second pressings" give, of course, a juice much less rich in solids than the first juice.

According to the United States government definition of cider vinegar that made from juice by such treatment is not regarded as coming under the head of pure cider vinegar. While something may be said in favor of such a practice, it would hardly be safe to allow unlimited use of "second pressings." It is true that a considerable proportion of sugar is not extracted with one pressing, and that under carefully controlled treatment a second juice might be obtained which, mixed

with the first juice, would give a vinegar well above legal requirements in acid and other constituents. In general, we cannot advise the use of "second pressings" for the reason that in nearly all cases too much water is added to the pomace in actual practice. Proper control could be possible only in the case of factories employing trained experts. So far as the home manufacturer of vinegar is concerned conditions are best left as they are, which permits the use only of the juice pressed out without water treatment.

When apple juice is left exposed to the air it is gradually changed, losing its sweet taste and giving off bubbles of gas more or less vigorously. The most prominent change is the conversion of the sugars into alcohol and carbon dioxide gas. This change is known as an alcoholic fermentation and is caused by a vegetable ferment or an enzyme which is produced by ordinary yeasts. Cells of the yeast plant are so widely distributed that they get into apple juice abundantly under ordinary conditions. Theoretically, we should be able to get from 100 parts of apple juice about 51 parts of alcohol. In actual practice we are not able to obtain this amount of alcohol because some of the alcohol is lost by evaporation and some is lost by certain chemical changes that take place along with the alcoholic fermentation. In general, we may expect that in the usual fermentation of apple juice 45 to 47 parts of alcohol will be obtained from 100 parts of the sugars of apple juice. In passing, it may be mentioned that in freshly expressed apple juice prepared from sound fruit I have never been able to find any alcohol. Sweet cider is, therefore, a strictly temperance beverage, but perhaps not everyone could be trusted to tell just where the dividing line is between "sweet" and "hard" cider. Happily, we are not called upon to settle this question at this time.

The rapidity of alcoholic fermentation depends largely upon temperature. In ordinary cellar storage, at a temperature of about 50 degrees Fahrenheit, it takes about six months to convert the apple-juice sugars entirely into alcohol. At a temperature of 75 to 85 degrees Fahrenheit this time can be reduced one-half or more. The higher the temperature the more rapidly the yeast plant grows and the more rapid is the fermentation. There is one serious objection, however, to temperatures above 75 degrees Fahrenheit, and that is the loss of alcohol by evaporation. This is favored also by the rapid escape of gas when the fermentation is very vigorous. We have found that the alcohol in fermentation may be started more promptly and pushed along more rapidly by adding yeast to fresh-apple juice, especially when the temperature is between 65 and 75 degrees Fahrenheit. The use of any form of commercial yeast, if sufficiently fresh, will probably be found to give good results. I have actually used only Fleischmann's compressed yeast. The completion of alcoholic fermentation is

generally indicated when bubbles of gas cease to come off vigorously.

After alcoholic fermentation is completed another change takes place—the alcohol is converted into acetic acid, and the final object of the vinegar maker is the production of acetic acid. This change is brought about through the agency or micro-organisms called acetic bacteria, these being entirely different from those that change sugars into alcohol. For the effective conversion of alcohol into acetic acid or of cider into vinegar there are needed: (1) Acetic bacteria; (2) an abundant supply of air, and (3) a temperature of between 65 and 85 degrees Fahrenheit. There is commonly noticed in vinegar a very elastic, slimy, tough, transparent skin of a yellowish-white color; this skin is commonly known as "mother" of vinegar. This appears to be formed by the growth of the acetic bacteria on the surface of the liquid. When one skin has formed it settles sooner or later and in its place another is formed, and this formation and replacement continue as long as air is supplied under favorable temperature conditions and as long as unchanged alcohol remains.

Theoretically, we should obtain from 100 parts of alcohol 130 parts of acetic acid, but for various reasons the actual yield is usually below 120. The chief change that takes place in the acetic fermentation of alcohol is the taking up of oxygen by alcohol, which is thus changed into acetic acid. Hence air is an absolute essential. Acetic fermentation as usually conducted by farmers takes place much more slowly than the alcoholic, often requiring eighteen months and in some cases two or three years.

The most satisfactory results of acetic fermentation have been obtained by us at temperatures between 65 and 75 degrees Fahrenheit. The rapidity of acetic fermentation can be greatly increased by introducing into the alcoholic cider acetic acid organisms in the form of "mother" of vinegar. In a cool cellar cider that has been thus inoculated by the addition of cider vinegar or of "mother" reached marketable condition a year sooner than where nothing was added. This precaution must be borne in mind: Never add vinegar to cider in which the alcohol fermentation is not completed, since the presence of acetic acid greatly delays the alcoholic fermentation. Many farmers and vinegar makers make an unwise practice of adding fresh apple juice to old vinegar, expecting to secure a more rapid formation of acid, and then they complain that the cider won't work. The apple-juice sugars must first undergo alcoholic fermentation before the acetic fermentation can begin. Therefore, by adding apple juice to old vinegar the alcoholic fermentation may not be only delayed but absolutely prevented.

The following is a practical method of inoculating cider with acetic bacteria: When the alcoholic fermentation has stopped, which, under favor-

able conditions, should be in one to three months, the cider is placed in barrels, filling half full and then adding one-fourth volume of old vinegar. "Mother" of vinegar is then prepared as follows, and added: Expose in a shallow, uncovered crock or wooden pail a mixture of one-half old vinegar and one-half hard cider at 80 degrees Fahrenheit. In three or four days the surface should be covered with a gelatinous coating, which is "mother" of vinegar. A little of this carefully removed with a wooden spoon or flat stick should be laid gently on the surface of the mixture of cider and vinegar prepared as described above. Do not stir it in, because the acetic ferment grows only on the surface where it can have an abundant air supply. In three or four days the coating should spread itself over the entire surface. This coating should not be broken or disturbed as long as the acetic fermentation is going along satisfactorily. When this method is followed the vinegar should be complete and marketable in one to three months after the alcohol fermentation is finished.

In vinegar factories the fermentation of acetic acid is greatly hastened by the use of "generators," in which the alcoholic liquid is brought into intimate contact with a larger supply of air. The "generator" is a cask three to six feet in diameter and six to twelve feet high. It is loosely filled with beechwood shavings, which have been especially prepared and then soaked thoroughly in old vinegar. The cider trickles over these shavings in thin films at a rather high temperature (about 95 degrees Fahrenheit). The operation is completed in a few days. While vinegar thus made is likely to be more uniform than that made in casks, generator vinegar is inferior in aroma and taste. The longer process is necessary for the development of the delicate flavor, characteristic of high-grade cider vinegar. In the hands of the average farmer, who has not large amounts of cider to make into vinegar, these generators can hardly be regarded as entirely satisfactory in every way.

We will now turn to the details connected with the making of cider vinegar and consider these under two general heads: (1) Conditions commonly producing cider vinegar below standard, and (2) directions for home-manufacture of cider vinegar. Several conditions may cause the production of cider vinegar low in acetic acid, that is, below 4 or 4.5 per cent. Among the more common of these conditions we mention the following: (1) Poor apple juice; (2) cultivation unfavorable to the necessary fermentation processes; (3) lack of proper care after vinegar is made.

Poor Apple Juice as a Source of Poor Vinegar.—By poor apple juice we mean one containing less than a normal amount of sugars, that is, less sugars than would be sufficient under normal conditions of fermentation to produce

vinegar containing less than 4 to 4.5 per cent of acetic acid. We should ordinarily be able to produce about 50 to 55 parts by weight of acetic acid for each 100 parts of sugar present in the fresh juice. Hence to produce vinegar containing 4 per cent of acetic acid we should need to use apple juice containing 7.3 to 8 per cent of sugars; and to produce 4.5 per cent of acetic acid would require 8.25 to 9 per cent of sugars. We here mention five conditions under which apple juice may contain less than the amounts of sugars indicated: (1) The fruit may be unripe, in which case the vinegar is not only low in acid but poor in color and flavor; (2) the apple juice normal at the start may be watered; (3) the juice may be made by treating pomace with water, allowing it to stand and pressing a second time; (4) the apples may be badly decayed, injuring also the flavor of the vinegar; (5) apples may be used which normally contain, even when ripe, an insufficient amount of sugars. Among such apples that have been reported are Ben Davis, Fanny, Gano, Loy and Montreal Beauty Crab. Of course we do not mean to say that the varieties mentioned never contain enough sugar for vinegar making, but simply the samples analyzed did not.

The following are the ones that most unfavorably affect the processes of fermentation: (1) Unripe fruit; (2) dirty or decayed fruit; (3) unclean barrels; (4) too low temperature; (5) insufficient amount of alcoholic or acetic ferment, and (6) lack of air, due to filling the barrel too full or stopping the bung-hole.

(1) **Unripe Fruit.**—We have already noticed the effect of the starch of unripe apples upon the fermentation processes, resulting in a slimy, abnormally dark mixture and an undesirable product.

(2) **Dirty Fruit.**—It is quite common that the apples used for vinegar making are refuse left lying on the ground until they become covered with soil and are more or less decayed. Under such conditions there is serious danger of getting into the apple-juice organisms that will interfere with the regular alcoholic and acetic fermentations, particularly the latter, either by lessening the amount of the products of those fermentations or by producing undesirable flavors.

(3) **Unclean Barrels.**—Barrels or casks are frequently used for vinegar making which are not previously cleaned, no matter what their previous condition or use. Undesirable organisms may be brought into contact with the apple juice in this way.

(4) **Storing Apple Juice at Too Low Temperature.**—Many, if not most, farmers place their barrels of apple juice at once in the cool temperature of a cellar, where it will usually require six months or more to complete the alcoholic fermentation. The material is left at the same temperature for the acetic fermentation, which takes place with extreme slowness. In some cases it may require three years or more before

the acetic fermentation is completed under these conditions, and ordinarily the time is two years or more.

(5) **Insufficient Amount of Alcoholic or Acetic Ferments.**—In some cases it may happen that there is an absence of organisms sufficient to start the work of fermentation in the right direction; or, as may more often happen, the ferments are not sufficient to make desired speed. Such a condition can, as we have seen, be easily overcome by addition of yeast and "mother" at proper stages.

(6) **Lack of Air.**—The acetic fermentation requires the presence of air, and this may be excluded by filling the barrel too full or putting the bung in tight, or by doing both at once. It often happens that the conditions have all been favorable, and that the vinegar is apparently sour enough; the bung is then tightly stoppered, when an analysis would show less than 4 per cent of acid. Before closing the barrel it would be well to have the amount of acid determined as soon as the vinegar seems sufficiently sour. When the barrel is thus tightly stoppered before the formation of acid is completed the fermentation soon ceases and the amount of acid does not increase further. Samples have frequently been sent or brought to me for examination under such conditions, and a low percentage of acetic acid was usually found. The vinegars generally gained in acid rapidly after they were supplied with air.

(7) **Lack of Proper Care After Acid is Formed.**—When the alcoholic fermentation is complete and the cider has become commercial cider vinegar of good quality destructive fermentation of the acid may be encouraged by leaving the bung-hole open and the barrel only partially full. In this connection we may also mention vinegar eels, which are so unpleasantly common in many home-made vinegars. They are produced by the small flies that infest exposed or decaying fruits. One method of keeping them out is to keep the apple juice from continued exposure; the placing of a loose cotton plug in the bung-hole of the barrel in which fermentation takes place effectively keeps out the flies after the juice is barreled. When vinegar is found to be badly infested with eels the only safe remedy is to heat the vinegar to 185 degrees Fahrenheit, but not above this, and then strain, afterward cleaning and steaming the barrel before replacing the vinegar and then keeping the bung-hole closed. Vinegar eels, besides being offensive to consumers, cause the vinegar to deteriorate sooner or later.

Directions for Home Manufacture of Cider Vinegar

Kind of Apples to Use.—Only ripe apples should be used, possessing a sugar content of not less than 7.5 to 8.5 per cent. Most varieties of apples commonly available possess the requisite amount of sugar when ripe, but not when green. The apples should not be decayed or overripe, because the amount of sugar is lessened in such

apples. The apples should be clean when gathered, and if not they should be made so by washing. The objection to dirt in the apple juice is the danger of introducing forms of fermentation that will interfere with the normal alcoholic and acetic fermentations which are desired. One objection raised to washing apples is the liability to remove the germs that cause the desired forms of fermentation. While in our own practice we have not met with such difficulty it is preferable that the apples shall, if possible, be clean when gathered.

Preparation of Apple Juice.—In the grinding and pressing of the apples care should be taken to observe ordinary precautions of cleanliness. In many cases it is the practice to add water to the apple pomace after pressing, let it stand a while and press again. This treatment yields an additional amount of juice, which, however, does not usually contain the requisite amount of sugar to make good vinegar, provided the first pressing has been efficient. Avoid the use of juice made from second pressing if you wish to make high-grade vinegar.

Putting Apple Juice in Barrels.—When practicable it is a good plan to store the freshly pressed apple juice in some large covered receptacle and allow it to stand a few days before putting it into barrels. In this way considerable solid matter held in suspension will settle before the liquid is placed in casks. The casks used should be well cleaned, thoroughly treated with live steam or boiling water, and should not be over two-thirds or three-fourths filled with apple juice. The bungs should be left out, but a loose plug of cotton may be placed in the hole to decrease evaporation and prevent dirt and flies getting in. The bung should be left out until the vinegar making is completed.

Management of Alcoholic Fermentation.—When the freshly pressed apple juice is at once placed in ordinary cellars, where the temperature during the winter does not go below 44 to 50 degrees Fahrenheit, the alcoholic fermentation is complete in about six months, assuming that the work is begun in October or November, though 80 to 90 per cent of the alcohol is formed in half this time or less. By having the fermentation take place at a temperature of 65 to 76 degrees Fahrenheit the time can be considerably reduced; however, it is not desirable to have the alcoholic fermentation take place much above 76 degrees Fahrenheit, since the loss of alcohol by evaporation is increased. By the addition of yeast to the fresh apple juice the fermentation can be completed in three months or less, especially if the temperature is 65 to 75 degrees Fahrenheit. It is suggested that one Fleischmann's compressed yeast cake or an equivalent be used for each five gallons of apple juice, if one desires to use yeast. The yeast cake is stirred in a cup of water and after complete disintegration is mixed with the juice. Whatever form

of yeast is used it should be fresh. Vinegar or "mother" should never be added to fresh apple juice or before the alcoholic fermentation is practically completed.

Management of Acetic Fermentation. When the alcoholic fermentation is completed it is well to draw off the clear portion of liquid, rinse out the cask, replace the clear liquid, filling barrel half full and then adding one-fourth volume of old vinegar. On the surface of this is carefully placed some "mother," prepared in the manner previously described. The acetic fermentation occupies from three to eighteen months or more, according to the conditions under which the fermentation is carried on. When the apple juice is stored in cool cellars and left there until it becomes vinegar of legal standard it requires from twenty-one to twenty-four months, or even more. When the alcoholic fermentation is allowed to take place in a cool cellar and the casks then removed to a warmer place the time of vinegar formation may be reduced from that given above to fifteen to eighteen months. Where the alcoholic fermentation is hastened by the use of yeast and the acetic fermentation favored by the proper temperature and addition of vinegar "starter" it is possible to produce good merchantable vinegar in casks six to twelve months.

Care of Cider Vinegar.—When the acetic fermentation has gone far enough to produce 4.5 to 5 per cent of acetic acid, then the barrels should be made as full as possible with vinegar and tightly corked, in order to prevent destructive fermentation of acetic acid and consequent deterioration of the vinegar. Do not try to place vinegar on the market until the standard amount of acid has been reached, which can be ascertained by sending samples by prepaid express to one of your state departments, either the experiment station or the pure food commission.

Missouri Grower Gets Fancy Prices

An Eastern publication states that an apple grower in Lebanon, Missouri, packed 6,000 apples for the trade this year, for which he received fifteen cents per apple. These apples will be listed on the menu cards of some of the large hotels at forty cents each. In connection with this deal it is stated that the apples were not only perfect but were picked with a couple of leaves attached, and were submerged in a solution to close the pores of the apple and thus retain the original flavor, also the fresh color of the leaves. Each apple was wrapped in tissue paper. Twelve sealed boxes, each containing one apple, made up a carton, with six cartons in a shipping case. One cannot help but wonder what the solution was. It is something we have not heard of in the West.

Editor Better Fruit:

I wish to say that I look forward to the arrival of your paper with a great deal of pleasure. Yours very truly, Henry Haile Dole, Alstead, New Hampshire.

Fruit Canning—Methods Followed in Commercial Canning

By A. W. Bitting, Food Technologist, Bureau of Chemistry, Department of Agriculture, Washington, D. C.

A MODERN cannery is no longer the rough, crude shed that once was thought to be sufficient for this purpose. First of all the location must be sanitary, away from manufacturing processes which of themselves are objectionable, such as soap making, tanning, rendering fats, etc., or any other processes which may give rise to noxious odors or be productive of organisms of decomposition. The yards and drives about the factory should be cleaned daily, and in summer dust should be prevented by frequent sprinkling or by the application of crude or specially prepared oil to the drives. The application of oil is especially to be recommended where there is much hauling and there is no pavement, or the factory is to be run for a short season only, as in the case of tomatoes. A single application made a couple of weeks before the season opens will suffice for several weeks; by putting the oil on early it will become incorporated in the earth and not be tracked into the factory to any great extent. The drainage must be such as to prevent any surface overflow from adjoining property, and also be ample to keep the stock in good condition at all times. It should be ample to care for the waste, as this is sometimes a serious problem. If the natural body of water available is not sufficient settling tanks or filters may be necessary. Fermenting material, such as tomato trimmings or corn refuse, should not be tolerated within or near the factory. The supply of water should be sufficient for all purposes and of good quality; that used in washing, blanching and brining should be free from excessive hardness or iron, otherwise the finished products may be damaged. If the water for this purpose is not naturally of the right quality artificial treatment will be necessary. The water used for washing about the factory should have a good pressure for cleaning. A factory with a poor location, or an insufficient or poor water supply, has a handicap which is difficult to overcome. The facilities for bringing in or sending out of stock should be ample, so that materials used need not be delayed, especially when it may mean deterioration.

The buildings should be designed with reference to the special products to be packed, but there are some features which should be common to all. The ceilings of all rooms should be high, with ample provision for light and ventilation. The light should come from numerous side windows, or, if the rooms are large, from turrets or a saw-tooth roof construction. Either of these arrangements can be made to give a flood of light and at the same time provide good ventilation. An advantage in the saw-tooth construction arises from the cooling and drying effect. When the straight section, or windows, are turned toward the north

the sun beating upon the southern incline will heat the layer of air underneath, causing it to rise. This creates a circulation within the room which tends to dry floors and tables and to lower the temperature. Tests made in factories so constructed have shown several degrees lower temperature on hot days than was recorded in factories having the usual form of roof.

One of the marked contrasts between the newer and older construction is the provision for plenty of light. Light has a beneficial effect upon employees, contributes to cleanliness and is an active, constant disinfectant. High ceilings and proper roof construction usually render artificial ventilation unnecessary, but if mechanical measures are employed a blower system, with provision for cleaning the air, is to be preferred to suction. An abundance of light and air is a combination which will contribute to the maximum of labor and efficiency.

A tight, hard floor is a necessity, and in all rooms where manufacturing processes are conducted it should be pitched about one and one-half inches for each ten feet. The pitching should have special reference to the position of machines and tables where there will be more or less water or waste, so that this may be confined and the floors be flushed clean and kept reasonably dry with the minimum of labor. There should be frequent trap connections with the sewer. The kind of material best adapted for a floor will depend in a measure upon whether it is to be used for dry work and storage or whether water is employed more or less freely. Factories having a short packing season, as in the case of tomato canning, find concrete to be the best. Wood shrinks, swells and cracks with changes of moisture; the cracks are hard to clean, leakage is almost certain to occur, and these conditions become aggravated in factories which are idle a part of the time. Wood with a smooth covering, such as sheet roofing, makes a good floor, but will not last long. Concrete is more or less porous, wears rough and is not an ideal floor, but is the best for certain conditions. Asphalt wears away and crumbles too easily. Upper floors should not be chosen for food preparation if plenty of ground space is available, for the reason that it is difficult to keep them tight. Furthermore, the work can be supervised to better advantage on one floor than on many, unless the departments are so large as to demand a superintendent in each. Conveyers can be obtained to handle products from one machine to another, and these are more easily kept clean than are floors. Conveyers and overhead tracks should be used in handling the product as far as is possible in preference to trucks, as the latter are destructive of floors and are not so clean.

The use of slat gratings to cover the floor about the kettles or other places where there is a splashing or overflow of water is especially to be commended. These may be made in sections about two by four feet, and can be taken up for cleaning. There is no excuse for floors being so wet or sloppy that the workers must wear rubbers, which is sometimes the case. All side walls, partitions, ceilings and supports should be smooth to admit of easy cleaning. Preferably they should be light colored and, as far as possible, of such material as can be washed with a hose, as this is the easiest method of cleaning or of applying whitewash. Some factories need to be divided by partitions to prevent unnecessary heating by steam from the cookers. In other cases the room where the material ready for the can is kept should be separated from the rooms in which the preparation is going on, in order to protect it from dust. That part of the factory in which prepared material is in any way exposed should be screened to keep out flies and dust. The latter precaution is often of greater importance than the former, for during the working period the moving of machinery and escaping steam will drive away insects.

The tables used in the preparation of foods should be plain and of a material that is easily cleaned. There should be no sharp angles or grooves where waste can accumulate, nor any places beneath where material can be stored. Hardwood, such as maple or ash, is probably the best material for the majority of factories. These woods will absorb little water or juices, they show soil quickly and clean easily with soap, water and scrubbing brush. Opal glass or porcelain makes excellent table tops, but is expensive. Enamel-coated metal has come into use, and under certain conditions gives excellent results. The important point is that the tables may be cleaned easily, and that it be done often. The machinery used should be of the most sanitary type and set in such a manner as to be accessible from all sides for cleaning. Conveyers for fruits, tomatoes and all other products should have automatic washers and brushes in their course to keep them clean. The amount and kind of equipment varies greatly, depending upon the product. Peas, corn and beans require the most, fruits the least. The details of the special requirements will be considered under each product. Water and steam pipes, with hose attachment, should be conveniently placed about the factory for cleaning tables, machines, floors, walls and ceilings. This is a necessary part of a modern equipment.

Provision should also be made for the cleanliness and comfort of the employees. Water should be placed at convenient places that the workers may wash their hands often, and sanitary drinking fountains installed to take the

place of the common cup. A factory is not complete without proper toilet and clothes rooms. The toilet should have facilities for washing the hands with soap and water, and hand brushes should be provided. There should be lockers for storing the outer clothes, as wearing apparel should not be hung about the factory. Providing special suits and a manicurist are refinements which are found at some factories and are not so much of an extravagance as less progressive firms would argue. For factories running continuously and employing the same help, there is no question but that uniforms are advantageous. For such operations as picking, peeling and pitting fruits, etc., which can be done as well sitting as standing, stools should be provided. Standing all day at tables is more than tiring—it is exhausting and decreases efficiency. This is clearly evident to every factory inspector, especially after the season has advanced. The stool is to be preferred to the common bench, so that the individual may stand or sit as may be most comfortable. If standing in one place over cement floors is necessary wooden springboards should be provided for the restful effect upon the feet. The various states provide the general conditions under which labor can be performed, age limit, number of working hours in the day or week, physical condition, etc. No person affected with communicable disease should be employed in a food factory.

The steps in canning will vary with the product, but in general there are certain processes which are common to all and may be described in this outline, as receiving the product, grading, washing, preparing for the can, filling, exhausting, capping, processing and cooling. The first requisite in all canning is that the product be delivered in first-class condition, fresh from the fields or orchard, and in a manner to prevent injury. Fruits, such as berries, must be handled in boxes as for the market, tomatoes in shallow crates; corn, peas and beans in such quantities that they will not heat, and marine products cold or chilled, and in compartments to avoid bruising. The condition of the material on delivery is of the greatest importance, and for that reason the factory should be located near the point of production, or, if shipment be made, the distance should be short and direct. A cannery which depends upon long-distance shipments or purchasing the supplies on a city market will generally be found to put out an inferior article. In any delivery the seller should be held responsible for the condition of the material; the grower has no more right to deliver decayed tomatoes than the canner has to use and ship them. The first case is usually a violation of a state law and should be dealt with accordingly; the second may be reached by federal statute if the shipment becomes interstate.

The second step, that of grading or sorting for quality, is one of great importance. A general inspection or

classification of all products is made by the foreman at the time of receipt, but this is insufficient. The real grade of any product depends upon the quality of the original stock rather than upon the syrup or brine added, or any subsequent operation, and the best time to make a separation is before the work of preparation is begun. A large part of the sorting can be done better by a few especially trained helpers, although some of it may be continued in subsequent operations. The hard and faulty ears of corn can be picked out more easily while it is being conveyed to the silker than by the cutter feeders. These men have enough to do to keep the machines busy and cannot take the time to sort properly. A few persons can pick out green, defective and wrinkled tomatoes which will not peel economically and do a better job before the fruit reaches the scalding than can be done by the peelers. The same principle holds true for peaches and many other products. Those who peel or fill the cans should have the minimum of grading to do. The sorting is usually done upon belts or special table tops to expedite the work. Berries are picked, stemmed and defects picked out when graded to save handling.

The next operation is generally that of washing, the method depending upon the material canned. In general, most products are placed in a tank of water to loosen adherent dust and dirt, are gently rolled over by the agitation of the water and sprayed as they emerge. The spraying is the important step, therefore it is desirable that the water have force rather than a large volume. A small spray with force will cut off dirt and adherent mold very successfully. The principle is the same as cleaning a floor with a hose having a nozzle, or with one having an open end; the former will use less water but will clean better. Some hard-coated products, as peas, are washed in revolving wire cylinders known as "squirrel cages." Soft fruit, such as raspberries, require very gentle washing, and if the fruit appears clean some packers object to washing it at all, claiming that it causes injury and loss of flavor. Whatever method is used, the cleaning should be thorough.

Many of the fruits need no special preparation other than cleaning and sorting, after which they are placed directly in the cans. Peaches, apples, pears, etc., must be peeled and cut into pieces of the proper size. Nearly all vegetables require more or less treatment; peas are shelled, graded for size and quality, and washed and blanched by automatic machinery; corn is cut, silked, brined and cooked; beans are snapped and strung, graded for size and blanched; asparagus is cut into lengths and blanched; sweet potatoes and beets are peeled and graded, and so on. The operation of blanching is in reality parboiling. Vegetables are dropped into boiling water for from one to five minutes, as a rule, to cause softening and at the same time to remove some

of the mucous substances which form upon the surface. The effect produced by a short boiling in the open as compared with boiling in the closed can is surprising. Peas or beans which are a little aged and hard will soften quickly in the blanch, but retain their condition in the can. In almost any case of very cheap peas some may be picked out which, if thrown upon a table or floor, will bounce a couple of feet or more. This is evidence that they were not properly blanched and that softening did not take place in the can. The operation of blanching is of much importance in putting up good vegetables. It is not a matter of whitening, as the name might seem to indicate, though it does have the effect of producing a much clearer liquor than would otherwise be present.

The cans should be washed just prior to being used. In the shipping and storing more or less dirt and dust find lodgement on the inside, and washing is the only method of removing it. The quantity of dirt which can be obtained from a thousand cans is usually a matter of surprise. The work is done very effectively at the present time by machines. The filling may be done by hand or machine. There are many products, especially fruits, which cannot be successfully filled by machine because of crushing or otherwise injuring them. When filled by hand the contents should be regulated by weight rather than by volume, so that the finished product will be uniform. If the filling be done by machine care should be taken to get the best results possible. It is illogical to use care in peeling a three-inch tomato and then have it squeezed through a two-inch opening in front of a crude plunger; or that great care should be exercised in washing and blanching peas which are to be run through a filler that will cut or crush enough to make a muddy liquor. Machines should be designed to fill with reference to the nature of the product and not to be merely "can stuffers." Vast improvements have been made in filling machines in the past few years, so that most of the work can be done with nicety and precision. All filling machines operate upon the principle of delivering a certain volume rather than a given weight, and for most products this method is very satisfactory. In all cases, whether the can be filled by weight or volume, the amount of material used should be all that can be put in the can in first-class condition. Brining and syrupeing have also been improved, the old-fashioned unsanitary dip box giving way to a sanitary filler.

After the can is filled, the next step is exhausting. This is best for all articles packed cold, but is unnecessary for corn, peas or products which enter the can hot or are covered with a hot syrup. Exhausting consists in passing the filled can through a steam box and heating the contents to 160 degrees Fahrenheit or above, the preference being for 180 degrees. The

time required for exhausting will vary from one to three minutes.

Capping and Testing for Leaks.—Open-top cans are sealed by a special machine known as a double seamer. The lid is pressed into place and steel rollers crimp it on without acid or solder. This action is automatic, a single can at a time, but at the rate of 30 per minute, or 1,800 per hour. Cans with solder tops are sealed by automatic machinery, 12 at a time, 85 per minute, or 5,000 per hour. The top is wiped, the cap placed on, acid applied, the hot soldering irons drop into place, and the vent is afterward closed, all in one series of operations, without touching by hand. As the cans pass from the capping machine they may be submerged in a bath of boiling water to test for leaks. Any imperfection in the can or defect in sealing will be shown by a series of air bubbles issuing from the opening, and the can is at once taken out by the inspector for repairs.

After capping the cans are processed according to the nature of the contents. The cans are collected in large iron baskets, which usually hold 270 No. 2 or 180 No. 3 cans, and three baskets fill a retort. If the processing is conducted at boiling temperature the retort is not closed, but steam is turned into the water which covers the cans. If the temperature is to be above the boiling point the retort is closed and either the steam is turned into the retort until the proper pressure and temperature has been reached or water is first turned in to cover the cans and the steam is admitted until the temperature has been attained. In processing fruits it is customary to use long vats containing boiling water and equipped with automatic conveyers, which carry the cans or crates through at such a speed as will process them for the necessary length of time. This period varies with the product. Sterilization depends on administering the proper amount of heat, and heating above the required temperature or for longer than is necessary only cooks the material to no purpose.

As soon as the processing is completed the cans should be cooled with water. Unless this is done the heat will be held so long that the contents become over-cooked—fruits are softened and tomatoes become liquid, even blacken; peas break and make muddy liquor, while corn acquires a brown color and a scorched taste. The cooling may be done by turning cold water into the retort, by removing the basket of cans to a cooling tank or by spraying with water in the air. There is less difference in the results obtained by different methods of applying either heat or cold than some claim; the important point is to accomplish these steps quickly.

In canning operations the product, salt, sugar or other seasoning and water are the only materials used. No hardener, bleach or preservative is employed, and in commercial canning there never was as much preservative

used as is common in the household operation. Saccharin and sulphites were formerly used in corn and peas, but their use has now been practically discontinued; on the other hand, the practice of selling a "canning compound" to housewives still continues, and will only cease when the nature and effects of such chemical preservatives are known and the lack of necessity for their use is appreciated.

The first container used was the ordinary glass bottle with a comparatively small mouth, and was closed with a cork. The next step was the use of a resinous wax to cover the cork. The bottle was modified to the more convenient or jar form and a groove run around the top so that a tin cap might be sealed in place with wax. This method of sealing was common in domestic canning until about 1890. The metal screw cap with the rubber ring and various other devices, most of which depend on a rubber or fiber joint to exclude the air, have been introduced since that date. The glass jar is largely used in domestic canning, but not commercially, as it is heavy, breaks easily, cannot be handled by automatic machinery, will not stand hard processing without special precautions and increases freight rates. Glass containers are used for preserves, spiced and pickled fruits and for the limited canning for which the consumers are willing to pay a fancy price. Very recently improvements have been made in glass jars and the methods of sealing which may extend their usefulness, especially to such products as cannot be preserved to the best advantage in tin.

The earthenware jar was brought out to offset the high cost of the glass jar; some of these were glazed inside, some outside and some on both sides. They were generally sealed with a tin cap by means of wax, though a few had earthen tops. Various forms were given to these jars, and some may still be found which have been in use for many years in rural districts. The earthenware jars had only one advantage over glass, that is in cost, but they had the disadvantage of having blow or sand holes. The earthenware jar is not used to any large extent in commercial canning, though some are used to pack bulk jams and stock for preserves, etc.

The tin can is pre-eminently the container used in commercial canning, and it is also used to a very large extent in home canning. Those used for the latter purpose retain the deep ring about the opening for the insertion of caps and sealing with wax; these are commercially known as wax-top cans. In commercial canning solder is used exclusively for sealing stud-hole or cap cans. The tin can has undergone a number of changes. The first cans had flush sides and ends, or plumb joints; these gave way to the stamped overlapped ends, and all inside soldering has been superseded by lock seams and outside soldering. Most solder caps are hemmed, so that only the amount nec-

essary to seal is used. The solder can has been superseded in many cases by the open top or so-called sanitary can, no solder being used on the can except in making the side seam. The former objections to acid and solder, on the ground that they contaminated the foodstuffs, have thus been largely overcome.

The most recent improvement in the tin can is the inside coating or lacquering. This type of can is known to the trade as the "enamel-lined" can. Various coatings have been tried at different times without entire success, and while the present lining is not perfect it does effect a marked improvement in many lines of packing. There are fruits and vegetables which attack the tin coating with more or less vigor, resulting in a loss of color, flavor and quality, and at the same time form salts of tin which are objectionable. The inside lacquered cans are especially effective in holding such articles as raspberries, cherries, plums, beets, pumpkin, hominy, etc. They do not add to such products as corn, peas, beans, tomatoes, or those which have little action upon the tin. Inside coating is accomplished in two ways—by baking the lacquer on the sheet and by spraying it on the inside of the finished can; further improvement in the container may be expected along these lines. The tin can is made in a great variety of sizes and shapes, but there are certain forms known as standard.

SIZES OF STANDARD CANS

Size	Diameter in inches	Height in inches	Capacity in ounces
No. 1	2 $\frac{1}{16}$	4	11.6
No. 1 tall	2 $\frac{1}{16}$	4 $\frac{1}{4}$	12.3
No. 2	3 $\frac{3}{8}$	4 $\frac{9}{16}$	21.3
No. 2 $\frac{1}{2}$	4	4 $\frac{3}{4}$	31.2
No. 3	4 $\frac{3}{16}$	4 $\frac{7}{8}$	35
No. 3 tall	4 $\frac{3}{16}$	5 $\frac{1}{2}$	39
No. 8	6 $\frac{3}{16}$	6 $\frac{5}{8}$	104
No. 10	6 $\frac{3}{32}$	6 $\frac{3}{16}$	107

The size of package used for certain products is fixed by trade custom and not by the needs of the consumer. For example, corn, peas, beans and such products are almost exclusively packed in No. 2 cans, tomatoes in No. 3 and California fruits in No. 2 $\frac{1}{2}$ cans. The No. 2 can of high-grade peas or corn contains about 22 ounces, or too much for one service for a family of two, three or four persons, and with peas in particular the unused portion is not so good when served a second time. A can holding sixteen ounces would more nearly meet the requirements. The same is true for a No. 3 can of tomatoes. The excess is waste in many cases and represents not only good material but the labor expended upon it, a larger can than is necessary and boxing and freight. These are all items which contribute to cost and a consequent lessening of the use of canned foods. The No. 2 $\frac{1}{2}$ can was developed as a short weight from the No. 3 and does not adequately represent the interval in size between the No. 2 and the No. 3. The No. 2 $\frac{1}{2}$ sanitary can holds only slightly less than the No. 3 in the older style, as the latter cannot be filled so nearly full and sealed. Recently a new style of can has been introduced for California fruits, espe-

cially for peaches, known as the lunch-eon size, which is one-half the height of the No. 2½. These are desirable because they will take in the large pieces of fruits, and apparently are meeting a demand. The same style in the square can is being used for asparagus tips.

At the present time some packers are trying to meet certain demands by varying the fill rather than the size of the can. For example, a well-filled can of tomatoes might retail at fifteen cents, the packer may reduce the quantity, add water and make the cans sell two for a quarter, or carry it to an extreme and sell for ten cents. A customer finding that the ten-cent can will furnish the amount of tomato wanted, and without waste, will repeat the order. The same methods are used more or less in packing fruits, using a quantity which will make the can sell for a certain price. This is a crude, unsatisfactory and manifestly expensive method, and also open to fraud by those who are unscrupulous. It would be far better for the packer to determine what size is wanted and use such sizes, filling them properly.

The label should tell the truth in terms which are direct and easily understood. It should give the name of the article, the grade, by whom packed and where packed, or the name of the distributor. Neither the names nor the illustrations used should be misleading. A picture of green peas in pods in clear relief and subdued type stating that the contents are soaked is hardly appropriate. If given a geographical name it must be the true one. Corn grown in Iowa is not Maine corn, though obtained from Maine seed. The use of such terms as "Maine style" for cream corn is in reality only an attempt to circumvent the intent of a true label.

There are no fixed standards for canned goods, though the canner and the trade do recognize and describe certain qualities in jobbing, and prices are made accordingly. The consumer has not been educated to know these differences. The labels usually carry descriptive terms implying superlative quality, as extra select, extra choice, extra fancy, select, choice, fancy, extra standard and, less commonly, standard. There are too many designations for the same product, and furthermore Mr. A's fancy may not be the same as Mr. B's. The grade may not be the same in two consecutive seasons, due to drought, excess of rain, intense heat or other cause; neither may it mean the same in different sections of the country in a normal year. In other words, at the present time the grade does not have a fixed character.

Again, when the syrup is one of the factors in grading a product that fact should be given, though it is not required. A consumer cannot go to the grocery and buy peaches in a 40, 30 or 20-degree syrup, though the packers use care in preparing such syrups to use for their different grades. Such designations as heavy, medium and

light syrup are also inadequate. A heavy syrup may mean anything between 35 and 60 degrees, a medium between 20 and 45 degrees and a light between 10 and 30 degrees, depending on who uses it. These variations are too wide to be carried under such elastic terms. There is no doubt that some fruit packed in light or 20-degree syrup is just as good as that put up in medium or 30-degree syrup, but there can be no harm done by giving the exact facts. On general principles, if it is worth while for the packer to select his stock carefully and put up different grades the consumer should know how to select them.

A can of any food should be as full as it can reasonably be packed and processed without injuring either the quality or appearance of the product. There is such a thing as over-filling as well as under-filling, and one is as much a fault as the other. All foods packed in a liquid or semi-liquid condition, or as solids surrounded by liquid, should fill to within one-half inch of the top, and when free liquid is present it should cover the solids. Corn or peas an inch below the top would be a slack fill, even though covered with liquid. The fruits present a more perplexing problem, depending upon the size of the pieces and the degree to which they shrink in the syrup. The very choice large peaches, having only five or six pieces to the can, will weigh only 18 or 19 ounces and be as full as they can be sealed. A slightly smaller size, of seven to nine pieces to the can, will weigh 20 ounces, and for more than ten pieces the weight will be from 21 to 22 ounces. After they have been cooked in the syrup the pieces will soften, the weight will change and the fill will not be the same, though in all the amount was as much as could be sealed. If the cans be judged upon weight of the solids alone the highest grade would be short weight; the quality must also be considered. The presence of only eighteen or nineteen ounces of low-grade peaches would be manifestly slack filled. Soft berries, like strawberries and raspberries, if filled as full as the can will hold and syrup or water added, will appear only one-third to one-half full of solids upon opening and considerable variation will occur, depending upon their condition. Some foods can be packed so as to give a fairly uniform net weight upon opening, but with others the volume of solids and its own liquid is a fairer measure. The buyer is entitled to a full can and most packers try to furnish it.

The term "canned" as applied to food products put up in hermetically sealed packages is capable of more than one meaning. Originally it meant any food put up in any container which might be hermetically sealed and the preservation accomplished through sterilization by heat. In commercial use the term "canned" applies only to foods put up in tin containers and sterilized by heat. Under that con-

struction any foods put up in glass or other containers than tin are not rated as canned foods, nor are foods put up in tin in which preservation is accomplished by some means other than heat. Fish cured in brine, pickled or spiced, but packed in tin, is not canned within this meaning of the term. Fruits preserved with sugar, placed in glass or tin jars and sealed in vacuum are not canned in the commercial sense. The same is true of smoked meats, such as dried beef, and fish, as smoked herring. In domestic canning glass jars are generally used and the product is referred to in the home as canned. It is unfortunate that the term should have so many meanings. In the trade it is now common to refer to fruit in glass, sliced bacon and chipped beef in glass or tins, sliced or smoked fish in glass or sardines in tins and candied fruits in glass.

Spoilage may result from insufficient processing, defective containers or the use of unfit material. These losses are generally classed under the heads of swells, flat sours and leaks. Formerly losses were heavy at many factories, but these are becoming less each year, due to a better knowledge of what is necessary in material, handling and improved appliances. More attention is paid to testing for bacteria, and greater care is taken in obtaining accurate thermometers and gauges, automatic temperature regulating devices and time recorders, so that little is left to the judgment of the processor or helper.

Spoilage due to insufficient processing is generally divided into two classes, swells and flat sours. In the former there is generation of gas, causing the ends of the can to become distended; in the latter the content of the can is sour, but there is nothing in the appearance of the can to enable the customer to determine the condition until the can is opened. Swells are generally due to under-processing good material, while flat sours most often result from giving the regular process to material which has been allowed to stand for some time, such as peas remaining in a load over night or corn left in a car or in a pile until it begins to heat. The raw material may show no evidence of fermentation on superficial examination, but this condition frequently exists under the conditions just cited. Swells are therefore more likely to be associated with rush operations and flat sours with an overstock or delay in getting at the raw material. It is not intended to give the impression that swells and sours may not occur under other conditions, such as changes in the consistency of the corn, nor that swells may not occur in material which has stood, and sours result from under-processing, but only to state a general rule.

Swelling or souring may take place shortly after processing or the spoilage may be delayed for weeks or even months. Swelling is more likely to occur and be detected early, while souring is apt to be delayed, though it

The Orchard By-Products—Conditions and Possibilities

By L. R. Alderson, Lewiston, Idaho, and Clarkston, Washington

CONSERVATION of our National resources has been a popular subject of recent years and one of justified importance for the public welfare of the future. We are considering today, however, another feature of the conservation problem, of perhaps equal moment and certainly of transcendent importance to the fruitgrower of the present time—that of conservation of our domestic resources, or such portion as may relate to the husbandry of our section. The year 1912 is soon to pass into history and will be remembered as one of abundant harvests in nearly all branches of agriculture and horticulture. Mother earth has demonstrated conclusively that her treasure houses of wealth continue inexhaustible, her versatility omnipotent and her generosity unlimited. Surely man is blessed indeed; there is more air than he can breathe, more land than he can cultivate, more water than he can control and more fruit at times than he knows what to do with, especially when the peach trees work overtime and King Pip V, Brother Jonathan, Maiden Blush and the little red apple vie with each other in an effort to see which can do the most for the country. Bountiful crops, however, in times of unpreparedness are not a good thing; frequently reduced tree vitality follows, markets are flooded without discrimination and orchard waste is enormous. Some highly exaggerated reports of orchard loss have appeared this year, and others evidently fully justified. Probably no systematic effort has ever been made to compute crop shrinkage, but the fact remains that every year we see large quantities of deciduous fruit and apples brought to the point or harvest and lost. This must not be confused with ordinary windfalls or blighted fruit, nor is it confined to years of large production. Six years' observation of Northwest conditions lead me to believe that this loss is gradually on the increase, and whether crops are large or small a considerable quantity annually falls to the ground. One cannot but reflect upon the statement that whole nations might live and profit upon the waste of this country. Let us take heed; no one wants to be considered a prodigal, even if our methods are wasteful.

The causes of this waste are multifarious: Inadequate fresh marketing facilities is a prime factor. Labor scarcity is a grievous source of difficulty in handling the tonnage for fresh shipment. The almost total absence of by-product plants in many large districts is a serious and startling fact, and there other causes, all of which enter vitally into the result.

Credit must be accorded private enterprise for making some effort to cope with these conditions; the vinegar plants at Pullman, Walla Walla and North Yakima and the present efforts in evaporation at North Yakima and

Ellensburg deserve support and patronage. At Puyallup and Lewiston some degree of success in the canning line has been reached, the former making a record on berries this year which will stand alone for some time to come. I believe that the Puyallup and Sumner Fruitgrowers' Association is probably the most conspicuous example of co-operative canning and preserving in this country today. It should be borne in mind, however, that the factory problem of berry canning is much less complicated than that of fruits which have to be peeled, pitted and carefully graded as to size and quality, such as the peach and similar fruits.

The State of Oregon has long since demonstrated that they could evaporate their prunes and other fruits successfully, and sell them, too. Would you believe that evaporated Irish potatoes from Oregon have been commercialized to some extent in the Alaska trade? This is not generally known, however, and the trade is, of course, limited; but no one can say that our brothers in Oregon overlook a good idea or fail to put it in practice either. Idaho last year sent a straight car of evaporated apples to New York City and sold it for twelve cents per pound, or slightly over. I have within the past week received a letter from Duluth stating that the wholesale grocery trade considered the quality of the evaporated apples of Washington superior to the Eastern stock they have so long been using. The average price of evaporated apples to producers, however, is approximately five to six cents per pound. But in many points of the Northwest, and particularly Washington, may be seen today the rusting relics of past struggles with by-products. Between Walla Walla and Milton lie the remains of an ancient evaporator. An old vinegar plant at Genesee was recently dismantled. At Yakima, Walla Walla, Freewater, Spokane, Sumner, Clarkston and many other places idle or dismantled factories testify to an earnest effort in the canning of fruits at these points some five to seven years ago, some of the embarrassments to which I endeavored to bring before the Washington Horticultural Association in convention last winter. Even before coming to the state I formerly read of the large evaporator at Elberton, only sixty miles below Spokane, situated in a fine prune district. The evaporator has not been operated since 1905, so far as I can learn. At Tekoa large Italian prune orchards were at one time producing, but are now almost gone, and yet the evaporated Italian prune is the superior of all and its profitable production every year almost an absolute certainty.

For comparison a moment, we have the following: During 1911 California produced 187,800 tons of dried fruit, consisting of the following: Apples, 3,500 tons; apricots, 8,800 tons; figs,

5,250 tons; peaches, 13,000 tons; prunes, 88,000 tons; raisins, 67,500 tons; various other, 1,750 tons; a total of 187,800 tons dried fruit. The production of New York State evaporated apples during the years from 1902 to 1906, inclusive, is as follows: 1902, 16,682; 1903, 18,016; 1904, 18,062; 1905, 8,430 and 1906, 18,000 tons dried; and continues to average about 15,000 dried tons per year.

Washington has produced only a negligible quantity up to this time, aside from a few evaporated prunes in Clark County. Last year California produced 6,600,305 cases of canned fruits and vegetable. Washington about 100,000. California, however, has about fifteen million dollars devoted to the canning business alone, and almost every grower has his own bleacher and equipped for either sun drying or evaporating, or both. It must therefore be apparent that the Northwest, and particularly Washington, is deficient in attention to by-products, and if the truth were known, actually behind other states and sections at similar periods of their history. At the present time Washington is letting her fruit waste and annually sending thousands of dollars out of the state for supplies of dried and canned fruits, canned peas, canned tomatoes and other items, much of which can be produced at home, thereby reducing orchard and garden by-products from perishable commodities into staple articles and capitalizing at least a portion of the present waste into added wealth for our communities and our producers.

In the contemplation of a by-product program adequate to these conditions we must be intensely practical. We must stick to the rule of one, two, three and keep things in proportion. We must keep in mind that success is a matter of growth and sometimes comes after repeated failures. For instance, as compared with California and Eastern sections, we find new and unusual conditions, which cannot be measured by the same standards or handled in the same manner. The failures of the past have been necessary for the success of the future—in order that conditions and limitations may be established and shed light on the effort which may follow. Different climatic conditions have made some difference in the fruit itself. Time has been necessary to demonstrate the particular purpose for which a given variety may be best adapted. Limited sun drying must give way to artificial evaporation, and as the first requisite in solving the problem must be generally practiced individually. These and other equations are necessary for success. Therefore I submit for your consideration two propositions as prime factors in the solution of these problems: First, individual evaporation and hog raising; second, commercial evaporators, canning factories, denatured alcohol and

vinegar plants, and storage warehouses to be owned and operated by fruit-growers under a headquarters management, located probably at Spokane, with a million dollars capital, or more if necessary. In other words, the individual should do all he can to help himself, and by co-operation he must bring the cumulative force of a large organization to accomplish what he cannot hope to do individually.

Most individual growers can equip their places with close wire fences, and with a little start the good old primitive hog will do the rest. They require the minimum of attention, are good foragers, consuming the lowest form of orchard waste, worthless for any other purpose, and the inherent increment is rapid. In my childhood in California I was impressed with the fact that the most successful of our neighboring fruitgrowers were those who also raised hogs, and the same condition is found in the Northwest today. The fruitgrower who takes a good crop of pork to market some time each winter or spring has capitalized his orchard waste and his own time into dollars and cents that spell thrift, prosperity and contentment.

Individual evaporation will also accomplish much, and it is encouraging to note that considerable interest has been manifest on the part of growers the past season. I am convinced that every grower should erect an evaporator of suitable capacity for a fair portion of his surplus product. Individual practice of evaporation is common in many New York and Michigan sections and must become so in the Northwest. The trade demand for evaporated apples is as steady today as ever—in fact the demand for all evaporated fruits is increasing from year to year and their economic value established throughout the known world. Even during the past seven years California dried fruits have had a remarkable increase from 153,000 tons in 1905 to 230,000 tons in 1912, as follows: 1905, 120,700; 1906, 163,700; 1907, 153,000; 1908, 144,750; 1909, 188,500; 1910, 151,275; 1911, 187,800, and 1912, 230,000 tons dried.

Exports of evaporated apples from the United States for the past two years are as follows: For year ending June 30, 1912, 53,664,639 pounds, \$4,545,971; June 30, 1911, 21,804,086 pounds, \$1,944,209. A striking proof of the intrinsic value of dried or evaporated fruit for world-wide commerce is indicated by the exports into Canada from California of dried fruits as against canned fruits. The clearance from port of San Francisco for Canadian points for year ending June, 30, 1911, were as follows: Canned fruits, \$64,000; dried fruits, \$1,700,000.

The present customs duty is specific on each of these items, amounting to two and one-quarter cents per pound, and naturally our Canadian cousins appreciate the great advantage of adding their own moisture. Like everything else, however, artificial evaporation requires application and skill in

operation, and the attention of the Agricultural Experiment Station is called to the importance of rendering growers as much aid as possible next season. Most growers under our observation this summer made a total failure of evaporation of the peach, and bulletins should be prepared containing the elementary principles and suggestions for practical operation of home outfits. The marketing of home evaporated fruits should be aided by such an organization as herein suggested. From the standpoint of commercial evaporation it remains to be determined whether artificial evaporation of Northwest peaches is to be a financial success or not. Some claims are made that the shrinkage is fully 85 per cent and over. In our own experience we have noted this tendency to excessive shrinkage, although perhaps not to such an extreme, yet enough to raise the importance of a careful technical investigation, looking to improvement in the methods employed or selection of varieties best adapted for practical results. It is uncertain whether artificial evaporation can successfully compete with the drying, and this is a problem for the future.

Turning our attention to co-operative effort as the best solution of the commercial features of the Northwest by-product problem, we have before us probably the most neglected opportunity remaining unexploited by capital in America today. And yet this may not be singular, as capital is slow to enthuse even with a plausible prospectus. Again, private enterprises of small capital have been unable to do justice to the situation or make a satisfactory showing financially. What is needed are factories and storage plants actually capable of serving the various districts and handling a large amount of tonnage. This may sound like an idle dream or an Utopian phantasmagoria, but is nevertheless possible for realization to a considerable degree. I am confident, however, that it can only be accomplished by a large organization composed of growers in all the districts to be served, aided by liberal subscriptions of capital in exchange for bonds or debentures by the business community as a whole. Therefore I believe that Northwest problems must be worked out by Northwest growers for themselves—that you cannot expect outside capital or private interests to voluntarily come in and do these things for you, or at least not on sufficient a scale to afford many districts the needed relief or facility. For instance, for several years I thought the California Fruit Cannery Association would eventually occupy the Northwest field, or at least serve some of the large districts, but have about concluded that California activities are all-absorbing to them, and with the fruit industry of that state now on the eve of considerable expansion it is but natural to believe that California operators will be fully engaged with the increased development in their own section. Representatives of large California canning

interests have invariably expressed preference for their own section, from the standpoint of least resistance, and expressed pessimistic views on the Northwest field generally, with the single exception of berries and cherries.

The California Fruit Cannery Association has interests in Oregon, and operated for two or three weeks at Sumner, Washington, this year, for the particular object of supplying a temporary shortage of berries, but they have not operated other Northwest plants a day since the lease was first offered them several years ago, and I do not believe they, or any California company, are interested in Northwest peaches or other Northwest deciduous. Again, three years ago a large firm with almost unlimited capital, looking for a new field of operation in the canning business, after operating the Yakima factory for three weeks, withdrew from the Northwest and has since built two plants in California. I refer to Libby, McNeil & Libby, and I warn fruitgrowers now that if they expect to have canning factories they will have to support and patronize them systematically with sufficient fruit to keep under active operation, and not wait until markets break and then expect a small plant, owned by private capital, to successfully handle on a moment's notice hundreds of tons of fruit daily. Likewise the indifference of the Spokane tomato growers to the value of the Spokane Canning Company is reported to be one of the chief causes of the retirement of the company from business last spring. Therefore, in order to have these things I insist that you must create them yourselves in proportion as they may be justified in the various districts, and operate them for the benefit of the growers who have the foresight and courage to face the issue squarely and back it with their support. It is not necessary here to discuss the theory of co-operation or the method of application to this particular feature of the industry. This is secondary to the great and fundamental principle that in union there is strength, but under present disorganized and heterogeneous conditions there is only loss and disaster.

However, we have ample precedent and conspicuous examples before us of growers taking hold of large business affairs of this nature and operating them with signal success. Witness the California and Hawaiian Sugar Refining Company today operating the old Crockett sugar refinery at Benecia, California, which had been previously closed down by the sugar trust, and sugar production in the islands become unprofitable. Under the foresight and able management of a young man the growers of Hawaii were organized into a large company, coming over here and buying the refinery outright, for the purpose of refining and selling their sugar. The past eight years have demonstrated the complete success of the movement. Look also today at the improved conditions in the rice fields of Louisiana, since most of the rice

growers and mills have worked together under the name of the Louisiana State Rice Milling Company. A few years ago rice production increased considerably and became unprofitable from the fact of inadequate facilities for distribution, and a great many weak factors competing against each other and themselves. The trade were afraid to buy rice for fear that the next day the price would be still lower and their neighbor's stock would be on a less cost than their own. Today witness a steady market at good prices and the rice grower again contented with his vocation. And there are other industries where the aggregate power of the growers has had to step in and assume the burden of capitalization and management of manufacturing their products, as well as their collective distribution in raw state. Is there any reason why this cannot be accomplished with equal success with the fruits of the Northwest?

What should be done with a million dollars? Some folks would have a jolly good time on that snug sum, and it would not last a very long time either. Seriously, however, in the near future I would like to see substantial brick and concrete warehouses in most of our fruit districts, as evidence of the substantial growth and prosperity of the industry. In many of these there should be cold storage compartments having capacity for hundreds of thousands of boxes of apples and other fruits. In districts where justified there should be vinegar distillation, fruit evaporation and canning. I see the strawberry of Spokane and Milton; the cherries and peaches of Snake River, Walla Walla, North Yakima and Wenatchee; the blackberries and raspberries of the Coast; apricots, apples, pears, plums from other points, in fact the entire line of fruits, combined and offered to the trade the same as other large organizations, that say, "Give us your order; we can supply the entire list." One trouble heretofore has been that a small factory frequently could not supply the requisite assortment for the Northwest trade, nor could they manufacture their goods cheap enough to send them East to competitive markets. In fact inability to supply assortment, inadequate capital, insufficient volume of business, unsuitable location, high cost of materials, inability to sell goods at a profit and inexperience have accounted for most of the failures of the past, practically all of which can be overcome by a large organization rightly managed.

But this is not all. I shall be disappointed if in the future large factories for the canning of peas do not spring up in the Yakima Valley and other locations found to be favorable, and at Toppenish or the lower Yakima I think experiments should be made the coming season to determine the profitability of raising peas for canning purposes. The cannery at Payette, Idaho, puts up something like thirty to forty cars of canned peas annually, and has done so for eight or ten years past. Surely the conditions at Payette are no

better than we have in our own districts. I shall be disappointed if we do not can practically all the tomatoes we consume. In spite of the theory that north of a latitude running through Indiana and Northern Missouri it has been considered tomatoes could not be produced profitably, several locations have been found in the Northwest where good results are being obtained, and where tomato growing is steadily increasing and growers are now dependent upon by-product plants to take care of the surplus. At these same points—in fact in all of our districts—there are also desirable fruits, and there is little doubt of keeping the sales end of such a business active the year round, to increase and extend the market for these products.

It should be thoroughly understood, however, that these results cannot be accomplished by small units working at cross purposes, or by small factories built by machine promoters and operated by inexperienced parties. The weak holder generally sells his goods at less than cost, and not only ruins himself but ruins the market for everyone else. More than this, his expenses are disproportionate to the amount he produces. The canning season is short, and his fixed charges and depreciation go on without cessation. It is for this reason I believe the by-product and warehouse business should be combined, using, so far as possible, the same building, the same power, the same men and giving more active continuous employment for the same capital. Such a plan has the advantage of holding the working organization together from year to year and yet the force employed be kept busy in winter as well as summer. The fixed charges would be spread over a large business, producing a revenue nearly every month of the year. Still further, however, it will keep at home thousands of dollars of cold storage money now being paid to Eastern cold storage companies, the amount of which will undoubtedly be ample, if saved for the Northwest, to construct and maintain cold storage and by-product plants liberally wherever needed, and still make a saving to the grower. Therefore, in suggesting a line of action suited to the present and rapidly increasing needs of the Northwest, we should have in mind that the industry will soon reach proportions of the first magnitude, and the solution of its problems call for vast considerations. The greater the problems the more heroic may be the measures necessary to solve them. New conditions point to new departures. Capital must be forthcoming freely, but above and beyond all unanimous and continuous co-operation should be the fundamental and organic principle on which to build for future success.

Editor Better Fruit:

My high regard for your splendid activities goes without saying. Am simply repeating myself to say that Hood River, Oregon, and all the Northwest owes you a debt that it will be a long time liquidating. Yours truly, Wm. McMurray, General Passenger Agent O.-W. R. & N. Co., Portland, Oregon.

Gavel With Unique History

Mr. A. A. Quarenberg of Vancouver, Washington, did a very nice and unique deed by presenting the president of the Washington Horticultural Society with a gavel made from the wood of the oldest apple tree in the Northwest. One of the officers of the Hudson Bay Company, while at a banquet in London before sailing for the West, was given some apple seed by a young lady present, which he placed in his vest pocket. These he brought with him and planted at Vancouver, and the tree mentioned is one grown from one of the seeds. A picture of this tree appeared in "Better Fruit" many months ago. For many years the tree was given no attention whatever, but recently the officers at the barracks erected a fence around it, so that it is protected and is now being carefully cared for. It is hoped it will live many years longer. Apple trees are reported to be living in New York which are 100 years old. It is stated that in the country of the Five Indian Tribes, known as the Five Nations, there is an old apple tree with a well authenticated history handed down by the Indians, which indicates that it is 200 years old. There are a number of orchards in the Northwest planted by the early settlers for family use, of which there are many trees still standing in pretty good condition, considering they have been neglected for many years. Many of these are from forty to sixty years of age.

Yakima Valley Fruit Crop

Mr. F. Thompson, of the Thompson Fruit Company, in January gave the following figures in reference to the Yakima Valley fruit crop, from July to December, 1912. Yakima Valley shipped 7,175 cars of fruit in addition to the express shipments, a few still remaining in the valley. He figures his estimate to about 8,000 cars. Detailed estimate of the production is as follows: Peaches, 1,500 cars; pears, 225 cars; prunes, 200 cars; mixed, 200 cars; cantaloupes, 200 cars; watermelons, 100 cars; late apples, 5,400 cars; berries and miscellaneous, 185 carloads.

The Buster Brown Label

The Wenatchee Republic, some time ago, published a very interesting article about apples shipped by the Wenatchee Columbia Fruit Company, upon which they use the Buster Brown brand. The label consisted of a likeness of Buster, his dog Tige and a big red apple.

Almost the whole world knows of Hood River as a place that produces the best fruits, and all of Hood River Valley should know, and could know, that there is one place in Hood River, under the firm name of R. B. Bragg & Co., where the people can depend on getting most reliable dry goods, clothing, shoes and groceries at the most reasonable prices that are possible. Try It. [Advertisement]

A Co-Operative Cannery and What It Is Doing Successfully

By Walter S. Brown, President Benton County (Oregon) Growers' Association, Corvallis, Oregon

IT seems often that grim necessity must be at the helm before the ship of industry can steer a successful course. This was the case in Denmark, especially, before the farmers there organized their co-operative selling and credit associations. Not until they were fighting on the verge of the black abyss of financial ruin and starvation did they learn to stand shoulder to shoulder to beat down old customs and to establish better conditions. This movement spread through a large part of Europe until today the country folk, in their villages and on their farms, are saving money and are happy and content. The European farmer has brought about his success by means of co-operative buying in large quantities, by allowing no waste, and by establishing a system of credit based on the value of his real estate which allows him to borrow for development and improvements on very easy terms. American farmers have progressed far enough in civilization to begin to realize that there are other countries on the map besides their own, and during the past few years, driven by higher land values, keener competition and increased cost of living, have organized in isolated groups, more or less successfully, to better their conditions. So far their efforts have been along the lines of buying and selling. The utilization of by-products and elimination of waste has hardly begun, especially in the West, and a system of farmers' banks is still a matter of the future—near, we hope.

At Corvallis, Oregon, the Benton County Fruitgrowers' Association was organized to accomplish two results primarily: first, to market the product of our apple, pear, peach and prune orchards, and, second, to stimulate the growth of a larger acreage of small fruits and to market them profitably. Like many other sections of the Willamette Valley we have a diversity of soil types and a climate which enables us to grow more economically and successfully than our brothers of the Eastern States all the small fruits of the temperate zone. The question comes up, how are we to meet the conditions of great distance from large markets, of expensive freight rates and of proper distribution of our products. The problem of marketing the tree fruits of the Northwest is now commanding the attention of some of our brainiest men, but has certainly not reached the stage of quid erat demonstrandum. With the small fruits the problem is different. Provided you can raise a good product economically, can can this product well and distribute it through the proper channels you have almost an unlimited field for your operations.

Some five years ago a smooth-voiced stranger came to Corvallis and induced the farmers and townspeople to part with their hard-earned "dough" to start a cannery. He built and equipped a

plant entirely unsuited to the needs of the community with the result that, after the first season, the cannery had a large amount of unsold goods on its hands and suspended operations. This failure made it much harder to finance the new enterprise when we started it last year. Not until we had operated last summer successfully did we regain the confidence of the community.

The impulse to operate the cannery along new lines and the general scheme of organization we owe to Senator Paulhamus of Puyallup, Washington, who for several years has managed very successfully, along similar lines, a growers' association at that place. For the benefit of others who may be considering the organization of such an association I will outline briefly the scheme. In the first place the association is co-operative in the highest degree. One dollar is charged for a membership fee and one dollar per year dues thereafter. We want every grower in the community to become a member to give us cohesive strength, and thus to give us a large volume of business. No cannery can run successfully for any length of time without a large amount of "stuff" to can. No dividends, in the ordinary sense, are declared, but the profits are divided among the members in proportion to the amount and grade of produce each brings in. The only reserve made is one per cent of the net profits held back each year as a building and improvement fund. To each member is issued one share of stock and he has one vote, and one only, in the conduction of the business. Thus it is seen that the small grower enjoys as much power as the larger grower and each gets his full share of the profits of the business. The greatest disadvantage of this scheme of organization is that it gives practically no working capital to start with. The cannery plant is an expensive one and the running expenses are high. The cannery has no assets upon which to borrow money until part of the product has been canned. The first year is always the hardest one to introduce your product to the trade because the wholesalers contract most of their supplies in late winter or early spring, before a new cannery has a line on what it can supply, and because the wholesalers do not know the quality of your pack.

We bargained for a one-fourth interest in the old cannery plant at a very reasonable figure. We made repairs and additions to the building and used all the old machinery we could. Much of the machinery was out of date or unsuited to our purpose. This we discarded and installed in its place the best improved machines we could buy. An experience we had with a second-hand sealing machine led us to the conclusion the best is much the cheapest in the long run. To raise money, loan certificates of ten dollars each, bearing eight per cent interest, were issued. These did not sell as rapidly as ex-

pected at first, but as confidence in the management increased they went more quickly. As soon as we had canned products on hand in our warehouse we could borrow money at the banks with this as security. At the end of the season, in spite of these handicaps, we were enabled to give the growers a rate of profit little below that of other canneries in the Willamette Valley.

Let me say right here that a cannery is not an institution to be put up at every cross-roads. Many things must be very carefully considered. The plant with up-to-date machinery for economically handling the product is an expensive one, the manager must be one carefully trained along business lines with marked ability in mastering details, there must be a good canner or process man, and above all there must be a large tonnage of "stuff" for operating economically. For example, last year we put up and marketed thirteen carloads of product. At this writing (March 15) we have over sixty carloads contracted to be grown by the growers, with orders for a large part of it already placed. We have had to enlarge our plant this year and have had to install some additional machinery, but the cost of administration remains nearly the same as last year, with the result that the goods are put up much more cheaply on account of increased quantity. It is best to go slowly the first season until it is found what the needs of the community are and what the trade demands. Many a dollar has gone into machinery for canning products not economically grown in that community, and many a dollar has been lost by neglecting to find out what the trade really wants instead of what it ought to want.

Now as to the way the cannery is managed during the active season: We encourage every grower to become a member and we obligate ourselves to handle his product if he is growing the kinds of vegetables and fruits advised by the cannery. Uniformity of variety of vegetables and fruits is absolutely essential in putting up a good pack. The trade does not want a mixed lot of seedling cherries or a hodge-podge of different varieties of vegetables with which it is not acquainted. A few standard sorts of each kind of fruit or vegetable well put up is what the trade demands. This often is one of the hardest things for a farmer to understand. His wife has put up a certain fruit or vegetable for years and found it delicious; why should not the consumer of canned goods appreciate it? He does not realize that it takes time and money to introduce new things, however good. When a cannery has worked up a big business it may be able to introduce something new and fancy on the side, but until that time it is best to leave innovations alone. During the coming season we expect to have the co-operation of the merchants of Corvallis in

Continued on page 39

Watch These Things

By R. E. Olds, Designer

The leading cars this year have these features in them. They are things you should insist on.

Left Drive

Practically all the great cars of 1913 have the left-side drive. That means, of course, that others must adopt it.

They don't have projecting side lamps. They use electric set-in dash lights, as used on Reo the Fifth.

They are not under-tired. Skimpy tires, which double one's tire bills, are now much out-of-date.

Better Parts

Then today's idea among leading makers is to build enduring cars. To cut down cost of upkeep.

The best cars now, for years and years, will run as well as new.

But that isn't so with cars hurried and skimped—cars merely made to sell.

Note what it means to build a really honest car.

Reo the Fifth is built of steel made to formula—steel that we analyze twice.

Its gears are tested in a crushing machine of 50 tons' capacity. Its springs are tested for 100,000 vibrations.

Each driving part, as a margin of safety, is 50 per cent over-capacity.

We use 15 roller bearings, costing five times as much as common ball bearings. We use 190 drop forgings, to avoid the risk of flaws.

A \$75 magneto—a doubly-heated carburetor—tires 34 x 4.

Parts are ground over and over to get utter exactness. Engines are tested for 48 hours. Cars are

built slowly and carefully. There are countless tests and inspections.

Every Reo the Fifth marks the best I know after 26 years of car building.

New Control

And it has the new control. All the gear shifting is done by a single rod between the two front seats. It is done by moving this rod only three inches in each of four directions.

There are no levers, side or center. Both brakes are operated by foot pedals. So both front doors are clear.

Men are coming to cars built like this. Last year's demand was twice our factory output. Every man who buys a car for keeps ought to know this car.

Write for our catalog and we will direct you to the nearest Reo showroom. They are everywhere.

R. M. Owen & Co., General Sales Agents for Reo Motor Car Co., Lansing, Mich.

NORTHWEST AUTO COMPANY, 615 Washington St., Portland, Ore., Distributors for Oregon and Washington

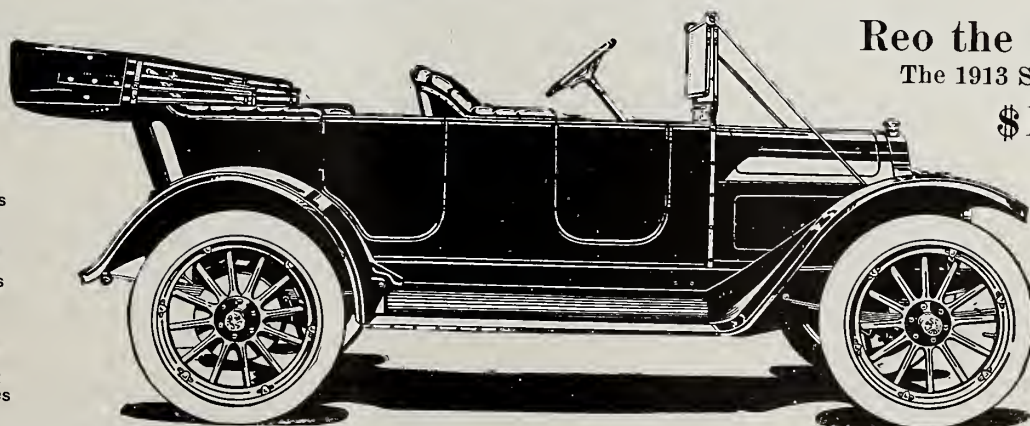
CANADIAN FACTORY, ST. CATHARINES, ONTARIO

Reo the Fifth

The 1913 Series

\$1,095

30-35 Horsepower
Wheel Base—
112 Inches
Tires—34 x 4 Inches
Center Control
15 Roller Bearings
Demountable Rims
Three Electric
Lights
190 Drop Forgings
Made with 5 and 2
Passenger Bodies



Top and windshield not included in price. We equip this car with mohair top, side curtains and slip cover, windshield, Prest-O-Lite gas tank for headlights, speedometer, self-starter, extra rim and brackets—all for \$100 extra (list price \$170). (Gray & Davis Electric Lighting and Starting System at an extra price, if wanted.)

Commercial Value of Unfermented Fruit Juices

By Carl J. Stackland, Cove, Oregon

THE process of manufacturing unfermented fruit juices being a question of technical details and equipment, lately developed to a high degree of manufacturing perfection, and involving somewhat the same line of experience as for canning and preserving fruits, together with cider making. We will not here enter into these details, but merely consider this product as it promises to aid in the solution of disposing of the surplus fruit. As there are now several firms manufacturing grape juice and what is called "boiled cider" it is not a new innovation, only that what is now done with the grape may also be done with the plum, prune, peach and apple, and in the same manner, not boil but treat to prevent fermentation, and to be sold as "unfermented" juices.

The present unfermented juices on the market are retailing for such high prices that general consumption is prevented, as pints of grape juice sell for forty cents each, or at the rate of over \$3 per gallon, and the Portland wholesale price is about \$2.40 per dozen, or twenty cents per pint. The "boiled cider" wholesales for \$2.60 per dozen quarts and \$9.70 per dozen gallon jugs, but are being retailed on the principle of "drugs" and not in general supply, not even known to the average consumer. With the above figures in mind, and without attempt to a real working accuracy, I will state, that with a large modern plant for making such juices, they can be put up in full quarts for about \$1 per dozen when allowing \$15 to \$20 per ton for the fruit; cased, f.o.b. cars for about \$1.20; therefore could and should be retailed everywhere for as low a price as a bottle of

beer; near the establishment, perhaps, three bottles for fifty cents up to twenty-five to forty cents, according to distance.

It must be pertinent to all that if so retailed there would hardly be an end to the markets to be gained for these juices, as when we contemplate the temperance statistics of the enormous amount of liquors consumed in the United States, and believing that these juices would come into general popularity, there should be an excellent place for all the "small apples" and many of the large ones. It should not be very difficult for all our Pacific Coast fruit districts to establish large modern plants for manufacturing all kinds of these fruit juices, and in order that every grower may have a direct benefit they should be on a co-operative plan, on the basis of a certain amount of stock per acre for the total capital required, which at the start would be considerable, in order to guarantee a full success. A campaign of advertising would be of first importance, and above all to secure the sale of the product at the lowest possible margins—at the level of staple goods sold in large quantities, and the whole thing would be one big success from the start.

The effect on the apple market may well be imagined, with all the inferior fruit eliminated, possibly half the total crop, as with such a condition, in most seasons, it might be found difficult to supply the natural demand, for the two products and prices would certainly become remunerative, to say the least. In connection with the manufacturing of unfermented fruit juices there is a large field for other products, such as

vinegar, jam, jelly, etc., and, if desired, certain kinds of fruit waste could be made into champagne, etc. Therefore we ought to have at least a half dozen plants in the Pacific Northwest with a capacity of at least two carloads of fruit per day, or twice that would be better still, and with plans for early enlargements. It should be easily financed with the assistance of advances on the product. But with all the difficulties of starting it should be undertaken in a large measure in order to help regain former confidence in the production of certain fruits and to guard against "overproduction" or under-consumption of future crops.

I regret exceedingly that my time is too limited for writing an article on the preparation of fruit juices, as it would require one of considerable length to be of any value to the inexperienced operator. I fully realize that the present time calls for the best missionary work among the fruitgrowers in order to "save the day" and assist in holding them to their best efforts, otherwise great losses will be sustained in every fruit-growing community. A very large market can easily be developed for unfermented apple juice, as by advertising it should sell as freely as grape juice, and in much larger quantities if placed to the consumer at fair prices. The retail prices of unfermented grape juice are so exorbitant that no great consumption could be expected, and it is a great wonder that the quantity consumed is very large at an average retail price of about four dollars per gallon. Unfermented apple juice could be made at a cost of only about fifty cents per gallon, bottled in "fives," apples at twenty dollars per ton, and if retailed for about the same as standard beers, twenty-five to thirty-five cents per quart, or short quart, should sell unlimited quantities.

RESULTS ARE BETTER THAN PROMISES

therefore, as CHAPTER ONE of its record of performances for 1912

The Northwestern Fruit Exchange

here submits a full statement of final results for the entire crop of Spitzenbergs and Yellow Newtowns (the main crop of the Mosier district), shipped by the Mosier Fruit Growers' Association. There are no omissions.

THE FOLLOWING PRICES ARE F.O.B. CARS MOSIER, OREGON:

Spitzenberg	Sizes:	64	72	80	88	96	100	104	113	125	138	150	163	175	188	200
Extra Fancy	\$1.90	\$1.75	\$1.65	\$1.63	\$1.47	\$1.38	\$1.26	\$1.19	\$1.20	\$1.11	\$1.12	\$0.98	\$0.95	\$0.70	...
Fancy	1.00	1.62	1.46	1.25	1.17	1.22	1.24	1.14	1.12	1.01	.91	.94	.86	.44	.47
C	1.27	1.21	1.06	1.00	.88	.79	.77	.79	.80	.78	.71	.70	.66	.35	...
Newtown																
Extra Fancy	2.27	1.99	1.80	1.67	1.54	1.64	1.39	1.25	1.11	1.04	.92	.88	.69	.55	.67
C	1.43	1.31	1.25	1.07	.95	1.00	.84	.76	.65	.59	.53	.49	.41	.65	.53

All averages announced by the Exchange are triple checked and are subject to verification by anyone interested.

Send for Booklet, "A Way to Sell Apples." It tells HOW

No-Rim-Cut Tires *10% Oversize*

Not a Petty Saving

Don't think that Goodyears won their place through any petty savings.

They were once in bottom place. Today they outsell, by long odds, all other tires in the world.

They have leaped to leadership.

The Goodyear demand has come like an avalanche.

Last year's sales by far exceeded our previous 12 years put together.

It took a vast, compelling reason to bring this change about.

Two Big Savings

The No-Rim-Cut tire—which we control—revolutionized conditions.

About one in four of all old-type tires were wrecked by rim-cut ruin. The No-Rim-Cut tire wiped out that loss completely.

Then the oversize we gave this tire added 10 per cent to the air capacity. And that, with the average car, adds 25 per cent to the tire mileage.

These two features alone vastly altered the cost of tire upkeep.

Other Savings

Then, year after year, we have spent fortunes on research and experiment.

That department now costs us \$100,000 yearly. And there scores of our experts work all the time, seeking ways to better tires.

They test the tires

by metered mileage—test every new idea. Night and day, four tires at a time are being worn out in our factory.

It was thus we learned, in the course of years, how to give you Goodyear mileage.

The Meters Tell

Bear in mind that meters are now used on countless cars. Men know which tire is best.

The time is past when users depend on makers' claims.

They measure mileage, watch their tire upkeep. And they tell their results to others.

Over two million Goodyear tires

have gone out to meet these tests. And Goodyear sales have doubled over and over as men proved out the tires.

Judge by This

Judge Goodyear tires by the final verdict of the legions of men who have used them.

You can see the No-Rim-Cut feature—the oversize feature. But the main fact lies in their records.

Motor car makers have contracted for 890,680 Goodyears to be used on new cars this year. And our demand from users is twice as large as last year.

The savings which did that are bound to win you when you make one test.

Write for the Goodyear Tire Book—14th-year edition. It tells all known ways to economize on tires.

GOOD YEAR
AKRON, OHIO

No-Rim-Cut Tires

With or Without Non-Skid Treads

The Goodyear Tire & Rubber Company, Akron, Ohio

Branches and Agencies in 103 Principal Cities

More Service Stations Than Any Other Tire

We Make All Kinds of Rubber Tires, Tire Accessories and Repair Outfits

Main Canadian Office, Toronto, Ontario—Canadian Factory, Bowmanville, Ontario

How Eugene, Oregon, Operates A Cannery Successfully

By J. O. Holt, Manager Eugene Fruit Growers' Association

THE panic of 1907 was directly responsible for the organization of the Eugene Fruitgrowers' Association. The growers saw that it would be impossible to dispose of the coming crop of fruit at anything like satisfactory prices. They met in January, 1908, and organized the association with a capital stock of \$5,000. About \$2,500 of this was subscribed and twenty per cent was paid up, giving us a capital of \$500 with which to do business. A warehouse was rented at ten dollars a month, thus we made our modest beginning, not without many misgivings as to the outcome but with a definite idea of what we wanted to accomplish. This plan has been followed consistently up to the present time. Our aim has been to advance the interests of the whole membership at every point possible. This policy has resulted in the large number of activities carried on at the present time. We will pass briefly over the five years during which the association developed into its present form. Our membership has increased from fifty to two hundred and forty. We have had excellent support from our membership. We have had strenuous opposition from outside sources at times, but this has only tended to strengthen the association internally. Two years after organization the capital stock was increased to \$25,000; about \$20,000 of this was sold and paid up in full. The local cannery, prune drier and packing house, with trackage, was bought and we moved into permanent quarters. Additions have been made from time to time until we now have about 30,000 square feet of floor space. We are at present building a new preparation and canning room 50x80 feet. This should give us ample room for the present.

We are in position to handle any kind or grade of fruit or vegetable raised in this locality, and in a manner suitable to the product. The green fruit packing room is located in the basement. The canning department and prune packing is done on the main floor. On the second floor is located the prune grader and box machines. One hundred feet from the main buildings is located the prune drier, which has a capacity of 800 bushels per day. We also have a plant for making lime-sulphur spray. The whole plant is so arranged that fruit may be transferred easily from one department to another. Apples rejected at the packing tables in the green fruit department are weighed up and transferred to the canning department or to the drier, the peelings and cores being used for vinegar. Each department is not only required to pay its own expenses but its share of the overhead expenses as well. We handle all sorts of spray materials, box shooks or finished boxes, sacks, nursery stock, lime, etc. These, together with our green fruit, canned and dried fruit, are sold to our members at cost plus han-

dling and overhead charges. Non-members buy at the market price.

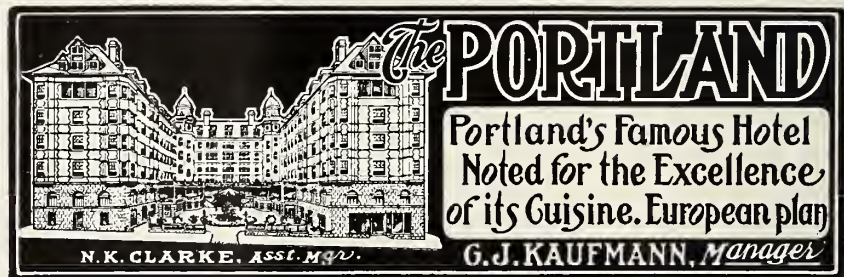
We attempt to work in harmony with the local retailers and are having good support from them. Berries and other fruits for sale in the city are delivered to our warehouse and are receipted for according to grade on delivery. An expert salesman makes the rounds of the retail trade once or twice each day, keeping them well supplied without overloading. We make the price and notice is given a day in advance of any change in price, allowing the retailer to clean up without loss. As an instance of our co-operation with the trade, at the height of the strawberry season we sometimes put a display ad in the local papers for a day or two calling the attention of the housewife to the fact that strawberries are now at their best and that it is time to do her canning, and for her to call on her grocer for them, naming the price at which she can buy them by the crate. We sign our own name and find results much better than the same ad displayed by the grocer. The housewife often puts off her canning until the best of the crop is gone, then rather than can inferior fruit goes without. We believe that fruit not eaten today is never eaten. We do not sell direct to consumers unless they are members. No inducement is offered those not actively engaged in fruit or truck growing to take stock in the association. Practically none of it is owned by people living in the city. The stock is now selling about twenty-five per cent above par. Only enough stock is sold to pay for plant and improvements and to cover the inventory carried over at the end of the year. It is cheaper to borrow the money as needed to finance the year's operations than to own it. The growers' fruit, which is not paid for until sold, together with the unincum-

bered property, is the best of security.

An extract from the annual report for the season of 1912 will show the scope of our operations. The total cherry and prune pack of last season is only about one-fourth of normal. Fruit handled:

	Pounds
Royal Ann cherries	106,959
White cherries	24,248
Pie cherries	7,755
Black cherries	7,457
	<hr/> 146,419
Gooseberries	39,110
Red raspberries	18,124
Loganberries	86,256
Blackberries	61,143
Strawberries	89,804
	<hr/> 294,437
Plums	31,909
Prunes (green)	49,294
	<hr/> 481,103
Peaches	15,966
Apples (canning)	212,113
Pears (canning)	84,506
	<hr/> 312,585
Spinach	873
Asparagus	2,734
Beets	3,404
Rhubarb	14,228
String Beans	93,038
Tomatoes	17,495
Cabbage	3,992
Pumpkin and squash	375,000
	<hr/> 510,744

The above totals about 1,000 tons of green fruit and vegetables. We also shipped several cars of boxed apples. We canned 17,815 cases of fruit and vegetables, put up five cars of pickled cherries and made 646 barrels of lime-sulphur spray. Perhaps one of the most useful functions of the association is to direct the growers' plantings. Our policy is to urge the planting of only such fruits and vegetables as are especially adapted to this locality, and if possible those which are not adapted to a wide range of territory. In the fruits prunes, cherries, pears and the berries are our leaders. Large plant-



Situated in the Hub of the Principal Theater and Shopping District
Recently Redecorated and Refurnished Throughout
And Better Equipped Today than Ever Before

EUROPEAN PLAN

Rooms without bath, \$1.00 per day and up
Rooms with bath, \$2.00 per day and up

G. J. KAUFMANN, Manager

N. K. CLARKE, Assistant Manager

ings of apples and peaches are not encouraged.

The Eugene Fruitgrowers' Association is an ordinary corporation run co-operatively. No individual is allowed to hold more than 500 shares of stock. Dividends are limited to ten per cent; we have usually declared six per cent dividends. Ten men, all fruit-growers, own about fifty per cent of the stock. This insures stability and makes it possible to carry out a definite policy. Our board of directors are all up-to-date fruitgrowers. Not all of them are large stockholders, however; they represent the highest type of rural business men. Some are university graduates, and all have made a success of their own business. They are selected not only to represent the different localities but so far as possible the different varieties handled. The fact that although there are nine members on the board and some of them live ten miles away, we have only lacked a quorum once in five years shows their devotion to the association and to the interests of the growers they represent. We make good use of the University of Oregon chemical department in working out our problems. We owe much to the professors in these departments. Each year we carry on experiments in a small way, adding whatever looks promising to our scope of operations. We expect to try putting up pickles in a small way the coming season. Auxiliary plants will be established at nearby points as soon as the volume of business warrants. Thus we expect to continue to expand just as fast it seems good business to do so, making each new addition a self-sustaining unit.

Wood Ashes for Trees

Save your wood ashes. If you are burning oak wood your ashes will be rich with potash, although the fir ashes contain considerable potash. These ashes should be kept so that they are not leached out. When applied around young trees early in the spring they are found to be excellent fertilizers. There is something about them that seems to be especially suited to tree growth and they often seem to stimulate a growth which is greater than the food value of the ashes would seem to indicate. The ashes can be applied around the trees in the early spring. A quart of them to a young tree would be sufficient. It is much better than to heap up large amounts around the trees. It is even better to sow the ashes broadcast. We are very wasteful of what fertilizing materials we secure on our farms. All material should be saved. It is better to haul out the manure from the barns as soon as it accumulates. Do not let it stand around the barns where it becomes leached. Hen manure is very rich in nitrogen, and all of this should be reserved for use on the strawberry bed, vegetable garden or the old orchard. It should be used in moderate amounts, as it is a very strong stimulant.

Who Can Make the Best Car for You?

The Case "40" is made by the J. I. Case T. M. Company, Inc., at Racine, Wisconsin. You know what this company stands for. For 70 years it has given thousands of customers the finest machinery in its line. These same customers are buying Case Motor Cars. The Case Reputation is at stake in these cars, just as it is in all Case machinery. We can and do make the best "40" that runs. Note the reasons:

We Know American Roads

For 70 years we have made machinery to travel country roads in every section of the American Continent. No concern knows so well what these roads demand. No other car that we know is equally fortified against all American road conditions.

How We Can Afford These Values

When we started making motor cars we didn't create a new business. We had 10,000 dealers and 65 branch houses before a car was made. We saved that selling expense.

We are capitalized at \$40,000,000. We saved the salaries of officers, sales and advertising departments, rent and other over-

head charges. These costs are added to the price of other cars and are costs that the buyers pay.

We Put Them Into the Car

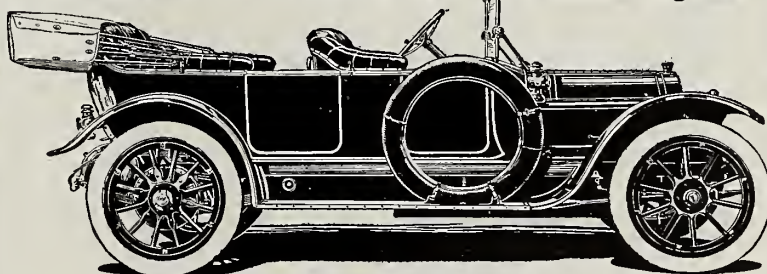
We put all these savings into the car. You pay nothing extra for them. We are able to give them. You might as well have them.

We could save on our motors by using cheaper materials. We could use cheaper clutches, drive shafts, axles, wheels, and save in other essential points. We could cut our assembling cost in two, and this is one of our largest costs.

Case extra values amount in each car to several hundred dollars.

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5-Passenger Touring, Fully Equipped, \$2,200

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Cut out and mail it now, while you think of it. Don't buy a car until you know what the Case has done. Note the equipment that comes with each car. Observe its style and finish.

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THE NORTHWEST FRUIT GROWERS' ASSOCIATION
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PUBLISHED IN THE INTEREST OF MODERN
FRUIT GROWING AND MARKETING

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REMITTANCES MADE PAYABLE TO

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1906, at the Postoffice at Hood River, Oregon,
under Act of Congress of March 3, 1879.

The Necessity of Saving the Surplus and Waste.—The editor of "Better Fruit" was invited to address the Spokane conference and the horticultural societies of the Northwestern States in November, December and January. After attending all of these meetings it was very evident to us that two problems were of vital interest to every fruitgrower in every section of the Northwest. These two problems were marketing and by-products. Realizing the desire of the fruitgrowers of the Northwest for more information about the marketing problem and with a view to assisting them to intelligently figure out ways and means of disposing of their product in a businesslike way, to create a wider distribution and greater consumption so as to bring better returns and put the business on a more profitable basis, we have decided to devote the necessary space in the editions of "Better Fruit" during the year 1913 to a complete and thorough discussion of these subjects, giving the views of the many able and broad-minded men of the country who have had experience in marketing, by-products, cold storage and transportation.

The editor devoted most of his time in December and January preparing the March issue of "Better Fruit," which was called "The Marketing Edition," and it is our pleasure to say that no issue of "Better Fruit" has ever brought forth so many complimentary letters. Hundreds of letters have been

received expressing appreciation of that issue. In fact every letter has, and many individuals have personally stated that the March issue of "Better Fruit" was the most valuable edition ever published on this subject. Hundreds of fruitgrowers have written and personally told the editor that the leading article, "1912 Apple Market—Evils Shown and Remedies Proposed," was the most comprehensive article on the subject that had ever appeared in any publication. The April number dealt with the marketing problem more extensively than the March issue and also included cold storage. The appreciation of that issue even surpassed the compliments in reference to the March issue.

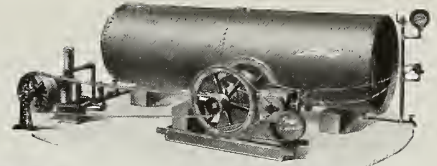
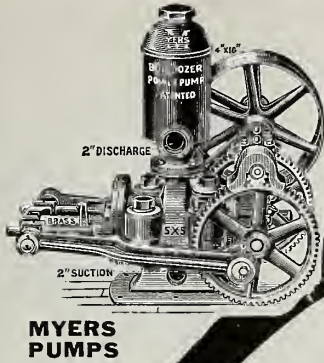
The May edition of "Better Fruit," devoted to by-products and marketing, will prove of equal if not greater value to the fruit industry of the Northwest. Experiences of 1912 afford us conclusive evidence that we are not justified in shipping our ordinary varieties or poor grades to the East. We cannot afford to allow them to waste. The solution is canneries, evaporators and by-products. The May edition and future editions will contain practical information on these subjects and will endeavor to assist the fruitgrower in solving these problems. Future numbers of "Better Fruit" will contain the usual number of articles on general subjects of interest to the fruitgrower in advance of each particular season, and in addition will follow out the intention conceived in December of devoting the necessary space to the problems of marketing, by-products, canneries and evaporators, and in every way will endeavor to render service and information of value to all districts with fair and general representation, with the hope of bettering the condition of every fruitgrower in every fruitgrowing section.

The general discussion of fruitgrowers at the various horticultural meetings of the Northwest during the past winter showed conclusively that they realized the necessity of canneries, evaporators, cider and vinegar and by-product plants. Up to the year 1912 the green fruit market practically consumed all grades and varieties of Northwestern fruits. With the increased crop of 1912 and the increasing crop in future years, it is now evident to all growers that means must be provided for canning and evaporating and converting into by-products the surplus fruit too ripe for shipment, varieties and grades that will not justify packing and freight charges. Necessity compelled the Puyallup Berry Growers' Association to take this step, and we point with pride to their success. Puyallup ships large quantities of raspberries and blackberries, which are very perishable. In harvesting many of these fruits are found to be too ripe for shipment and some means had to be found for caring for such berries to save the waste and make the business profitable. The cannery afforded the proper solution, and has been operating with phenomenal success during the

past several years. The Eugene Fruit-growers' Association has been successful in operating a co-operative cannery and evaporator, which takes care of the surplus, eliminating all waste. A cannery has been operated successfully for some seasons in the Lewiston-Clarkston district. Corvallis, with strong opposition and little support, succeeded in establishing a small cannery and the first year the output was eighteen carloads, notwithstanding the opposition and lack of support. The success was so phenomenal that this year the output will be increased to seventy-five carloads, or nearly 400 per cent. For many years the prune growers in various sections of the Willamette Valley have successfully operated evaporators which take care of the surplus, enabling the fruitgrowers to supply the green market in accordance with market conditions, thus obtaining a fair price for both green and evaporated fruit. In reality the evaporator has solved the problem and has resulted in assisting the prune industry to a profitable business, which is now paying from \$200 to \$300 per acre, whereas a few years ago the business was so unprofitable that many prune orchards were dug up.

Canneries in California have paid as high as \$60 per ton for Bartlett pears. Growers in California make good money in supplying peaches to the cannery at \$20 per ton. These few instances, it would seem, ought to suffice in proving both the necessity of the cannery and evaporator and by-product factory and also be sufficient evidence to indicate that they can be operated successfully and be of great benefit to the industry. It is a well-known fact that California has supplied nearly all of the Northwest with canned fruits, evaporated fruits, jellies and jams. The output of canned fruits and vegetables in California in 1912 was over six million cases, whereas the output in the Northwest probably did not exceed one hundred thousand cases. The output of dried fruits in California has approximately doubled in the last few years. This indicates an increasing demand for dried fruits. Mr. Fruitgrower, are you going to allow and compel consumers to go to California for these supplies and allow your own fruit to rot on the ground?

In many lines of business it is the saving of the waste or the surplus that makes the business pay a profit. It is stated that the big meat packers make absolutely no profit on the meat but they declare big dividends on the savings. Not a single ounce of a carcass is wasted. The hides are made into leather, the horns and hoofs into glue and the entrails into fertilizer. The pineapple growers found it necessary to establish canneries. At first, in canning, the juice was wasted. Some enterprising individual began to bottle the juice and quickly ascertained that the demand for the juice brought in a bigger amount of money than the canned output. The cores were thrown away. Then some enterprising individual discovered a use for the cores,



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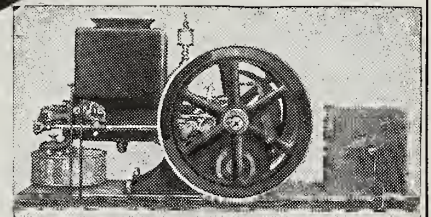
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PORTLAND

Spokane

Boise

STOVERS
GOOD
ENGINE



which were converted into a confection, and, strange to say, the amount of money received from the cores was greater than the amount received for both the canned pineapple and the juice combined. This certainly ought to be sufficient evidence to convince anyone that the apple grower ought to save by canning, evaporating, etc., not only all of the ordinary varieties of apples but all of the ordinary grades, the cores and the peelings. The peelings and cores can be made into vinegar. In Canada many apples are canned and

evaporated. The peelings are utilized and the cores are made into chops, for which there is a ready demand in Germany. The Canadian grower eliminates all waste in his apple crop. Germany uses apples for making champagne and apple wines. This is a field of consumption that should be investigated by the apple growers. Loganberries, strawberries, blackberries and raspberries and other small fruits are being canned successfully in some sections of the Northwest, and already considerable success has been met with in a

small way drying these fruits and also converting them into fruit juices, which are said to make delightful beverages for which there is a ready sale.

Many of the ideas referred to in this editorial are explained more intelligently and completely in articles which appear elsewhere in this number. The various articles in this edition will show conclusively that the ripe and off grades can be utilized and how. In addition attention is called to the fact that quite a few growers have operated individual plants putting up a home

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They're the only kind we make. If you are looking for the unusual and attractive in handsomely Lithographed Labels let us submit some samples and suggestions.

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NO ORDER TOO LARGE**

Schmidt Lithograph Co.

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product for which they have been successful in finding a good market. In fact a home product is usually of splendid quality and frequently commands a higher price because it is home cooked, on the theory that there are no pies so good as the "pies like mother used to make." Any enterprising individual can put up a home product and find a ready market if he will make the proper effort. Co-operative concerns will be necessary in order to care for the great quantity of fruit that must be canned, evaporated and converted into by-products. It must be borne in mind, however, that in order to conduct any of these successfully that certain ability is necessary. First, you must have a superintendent who thoroughly understands the technical process—many canneries have failed on account of poor processing; second, each institution must have an executive head of business ability for the disposition of the output. In order for a cannery or by-product factory to be a success we emphasize strongly these two facts: First, you must have a man who understands processing; second, an executive who possesses business ability.

North Pacific Fruit Distributors.—The National Apple Show of Spokane called a conference of growers for the purpose of discussing the marketing problem on account of the unsatisfactory prices that were realized in 1912, in Spokane during the National Apple Show. The deliberations at that meeting resulted in a call for representatives from each district for a meeting, which latter meeting was held in Spokane December 16, 1912. At this meeting a board of trustees was appointed, consisting of the following nine gentlemen: W. T. Clark, Wenatchee, Washington, president; J. H. Robbins, North Yakima, Washington, vice-president; H. C. Sampson, Spokane, Washington, secretary; H. F. Davidson, Hood River, Oregon, treasurer; N. C. Richards, North Yakima, Washington, general counsel; Henry Huber, Walla Walla, Washington; W. N. Sackett, Corvallis, Montana; P. J. Neff, Medford, Oregon; W. N. Yost, Meridian, Idaho, and W. S. Thornber, Lewiston, Idaho. Mr. W. T. Clark is president of the Wenatchee Fruitgrowers' Association, Mr. J. H. Robbins is manager of the Yakima Valley District Association, Mr. H. C. Sampson was manager of the 1912 Apple Show, Spokane, and Mr. H. F. Davidson is president of the Davidson Fruit Company, Hood River. The districts which these trustees represent were outlined in the January edition of "Better Fruit."

At a meeting held in North Yakima on March 31 the trustees got down to business very quickly and unanimously decided to proceed with the organization and perfection of a central selling agency with headquarters in Spokane. Mr. J. H. Robbins was elected general manager. An executive committee was elected, which included Mr. H. F. Davidson and Mr. H. C. Sampson. Mr. Sampson was elected secretary.

Make Your Orchard Show More Profit

Get full value from your orchard. Erect an Apple Evaporator of your own. The cost is small. Profits large. Send for our new catalogue. All about Evaporators. How to erect and how to run them.

IT'S FREE. SEND TODAY.

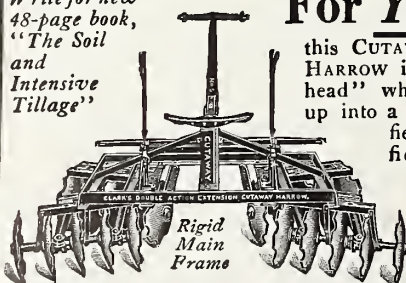
Strong, Dash & Hery Co., 301 State Street, Rochester, New York
"The Oldest Apple Evaporator Supply House in America"

For Sale!

An ideal fruit ranch, suitable for colony or private individual, situated in the Mosier district. Contains 160 acres, 120 of which is splendid fruit land, easily cleared, and every foot capable of cultivation. 40 acres in Newtown and Spitzenberg apples, 25 acres in bearing; 40 acres timbered land with creek running through, suitable for pasture. All necessary tools and implements, fine team of horses and wagon. Barn and necessary buildings for farm hands. A beautiful building spot for residence. The orchard has had the best of care and is in fine condition. Reasons for selling, owner cannot, owing to other business interests, give personal attention required. This will be a money-maker from the start. Price \$30,000. Address "Mosier," care "Better Fruit," Hood River, Oregon.

For Your Orchard Work

Write for new 48-page book, "The Soil and Intensive Tillage"



this CUTAWAY DOUBLE ACTION EXTENSION HEAD HARROW is unequalled. And yet it is not a "dead head" when not at work in the orchard, for it closes up into a regular double action field harrow for general field work. The

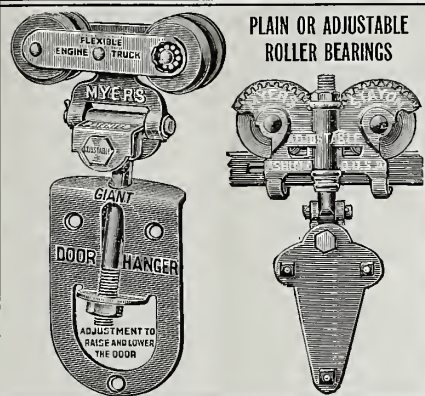
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CLARK'S

is the original double action. Its superiority is acknowledged by imitation. It is equipped with detachable jointed tongue, CLARK forged-edge disks and CLARK hardwood journals. CUTAWAY HARROW CO. 940 Main St., Higganum, Conn. Makers of the original double action harrows

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Legal contracts are now being drawn, which will be sent to the different organizations in the different districts for signature. As soon as these contracts are signed and the tonnage definitely ascertained, the North Pacific Fruit Distributors will be able to state positively just what the plans will be for the coming year. Such action as they may be able to take will necessarily depend on the signed-up tonnage. One system of grading rules will be effective for all districts. The object of the agency is to eliminate all competition, create a wider distribution and greater consumption, avoid the glutting of markets and reduce the selling expense to the lowest possible minimum. The tonnage of the association will come through individual associations in the different districts, each of which will be held responsible for the grade and pack.

The North Pacific Fruit Distributors expect to handle the entire fruit crop of all kinds from Washington, Oregon, Idaho and Montana. The sentiment for this organization is strong throughout the entire Northwest, and those who are familiar with conditions estimate that at least 10,000 cars will be signed. The salary of the manager will be \$7,500 per year. As soon as sufficient tonnage is signed up they will proceed to make arrangements for doing business this year, engaging the necessary selling force, bookkeepers, stenographers, traffic managers, etc. It is the intention to sell apples of all varieties from every district absolutely on their own merit. In addition to the regular charge, which we understand will be \$15 per car for selling, one cent per box will be charged to be used for advertising and exploiting purposes. The different associations will be known as sub-centrals. The executive committee

requires all districts which are not organized to perfect organizations to be locally controlled by fruitgrowers and to superintend proper packing, grading, etc. Each trustee has one vote, regardless of the tonnage from his district.

Motor Goggles for Spraying.—Many fruitgrowers, in spraying, complain about their eyes being affected by the spray, particularly lime and sulphur and bordeaux mixture. One of our subscribers, Mr. Alfred Chaplin, of Montreal, Canada, writes that he finds motor goggles a great help in protecting the eyes against spraying solutions which burn.

Editor Better Fruit:

I have yours of the 20th instant and in reply beg to advise that we have been getting very excellent results from our small publicity space in your magazine. I realize that "Better Fruit" is a periodical that appeals to the very best fruitgrowers in the country and we will be glad to continue our space in same from time to time when we are placing contracts. Please accept my hearty appreciation of your kindness in keeping me on your subscription list. Yours very truly, F. H. La Baume, agricultural and industrial agent Norfolk & Western Railway, Roanoke, Virginia.

Editor Better Fruit:

Please find check for one dollar. I need "Better Fruit" in my business. Yours truly, J. A. Southwick, Olympia, Washington.



This Book Sent Free

When you realize that we are giving you absolutely free an illustrated text-book containing 128 pages on Spraying, we are sure you will appreciate this enough to send us your address on a post card.

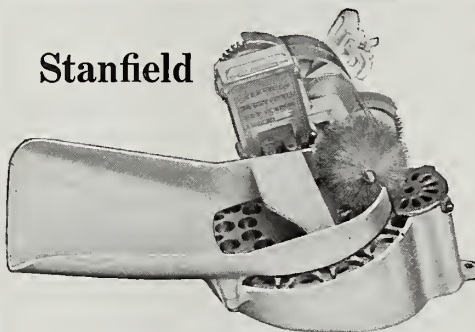
This book deals with the subject of Spraying in a broad way, giving complete data regarding the characteristics of the Insects, the time to spray in order to produce maximum results and the product to use. All the information is reliable as it was compiled from the actual experience of large fruit and vegetable growers combined with the latest achievements of Government Experiment Stations. A copy has been saved for you. Do you want it?

THE SHERWIN-WILLIAMS CO.

Insecticide and Fungicide Makers

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Stanfield



Cherry Pitter

Guaranteed Capacity
850 to 900 Cherries
per Minute

IMMEDIATE DELIVERY

Berger & Carter Co.

San Francisco, California

1,500 POUNDS
OR EIGHT
PASSENGERS

THE WHITE Combination Car

ANYWHERE
YOU WANT
TO GO

will give you more practical use, more comfort, more pleasure and last longer and cost you less to run than any car built. It's a roomy carriage and large motor wagon in one. Send for complete information.

The White Company

E. W. HILL, Manager

PORTLAND, OREGON

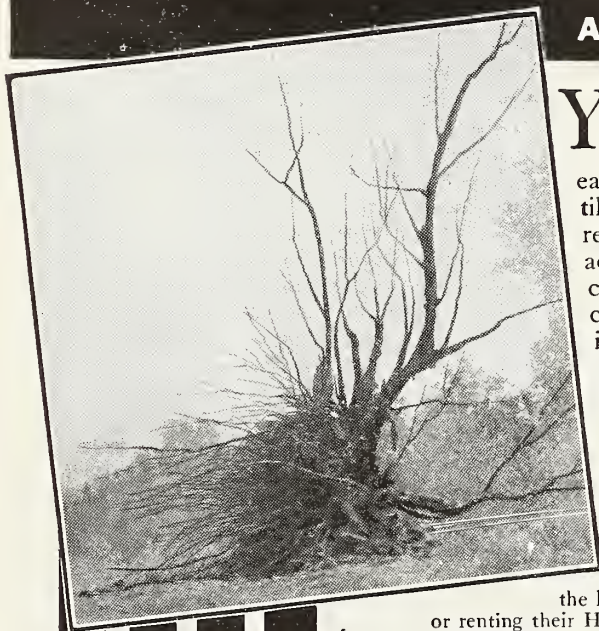
TREES

The kind that make you our friend together with the low surplus prices of the last season should induce you to let us figure on your needs for next season. We can and will please you. Every tree guaranteed well bred, clean and first-class. *Write Now.*

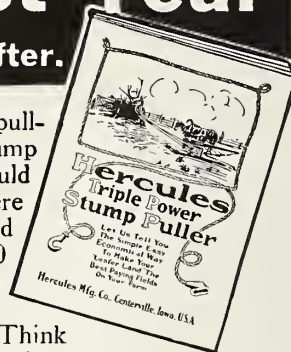
Southern Oregon Nursery
YONCELLA, OREGON

Your 40 Acres of Stump Land Can Be Turned Into a Profit of \$1281.00 The Very First Year

And \$750 Every Year After.

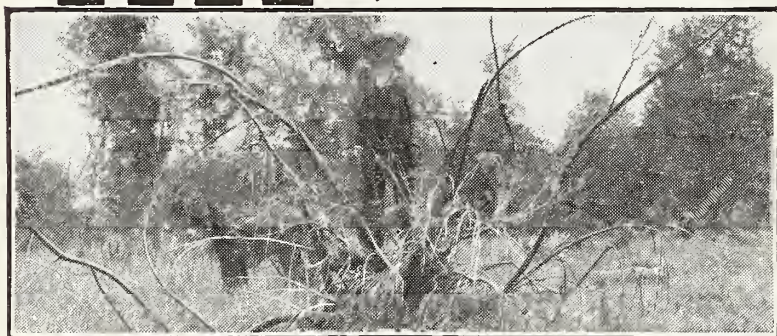


YOU can double the land value by pulling out the stumps. If your stump land is worth \$20 an acre—it would easily be worth \$40 an acre if it were tillable. On 40 acres the increased realty value would be \$800. On 40 acres of cleared land—*virgin soil*, you could easily raise 1500 bushels of corn—at 50c per bushel—\$750. Think it over Mr. Farmer. Stumps cost you big money. With land values going up—and crop prices as high as they are—you *can't afford* to keep on paying taxes for land that doesn't bring in a cent.



This Free Book Proves It

Read how thousands of other progressive men have pulled out stumps on their land instead of buying new lands. They've taken advantage of the virgin soil that the stumps keep away from cultivation. They've paid for their stump puller over and over again the first year with the profits from the extra crops and increased value of the land. And now they're doing contract stump pulling for their neighbors or renting their Hercules Stump Puller at a nice profit. But the main thing is, their own land is free from costly stumps—they farm all their land—and all their acres are at top-notch realty value.



machined and finished to reduce friction—hence the lightest draft machine. I want you to remember that the Hercules is 60 per cent lighter and 400 per cent stronger than cast iron or the so called semi-steel or new process steel which are catchy phrases now-a-days used to describe cast iron pullers; that you can clear almost three acres without moving the Hercules that the double safety ratchets absolutely prevent accident to the men or team.

HERCULES

All Steel, Triple Power Stump Puller

It will pull up any size stump, green tree or hedge in five minutes. It will clear an acre or more of stumps a day.

I want you to bear in mind that the Hercules is the only Triple Power, All Steel Stump Puller made; that it can be changed from triple to double or single power in a moment's time without trouble; that it is the only stump-puller having all the working parts

Guaranteed for Three Years

The all-steel construction, the triple power feature that saves your team and gives a tremendous increase of power, the double safety ratchets and careful turning and machining of every part—all these things make it safe for us to guarantee the replacement of any casting of a Hercules that breaks at any time within three years, whether it is the fault of the machine or your fault. Could any guarantee be fairer or stronger?

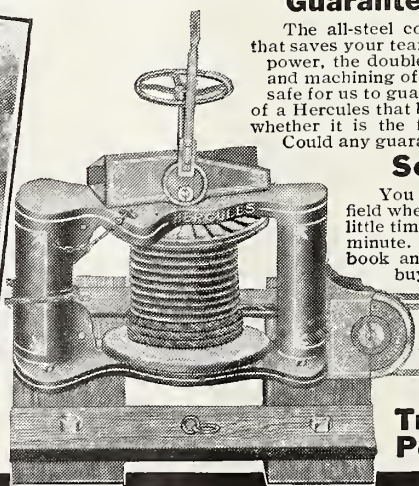
Send In Your Name

You cannot afford to have stumps in your field when it is so easy, so cheap and takes so little time to pull them out. Don't wait another minute. Mail me a postal at once for my fine book and my low introductory offer to first buyers. Address me personally.

B. A. FULLER, Pres.

Hercules Mfg. Co.

669 21st Street
Centerville, Iowa



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Statement of the Ownership, Management, Circulation, Etc. of "Better Fruit," Published Monthly at Hood River, Oregon

Required by the Act of August 24, 1912.

Note: This statement is to be made in duplicate, both copies to be delivered by the publisher to the Postmaster, who will send one copy to the Third Assistant Postmaster General (Division of Classification), Washington, D. C., and retain the other in the files of the Postoffice.

Editor, E. H. Shepard, post office address, Hood River, Oregon.

Managing Editor, E. H. Shepard.

Publisher, Better Fruit Publishing Company, E. H. Shepard, sole owner and publisher; post office address, Hood River, Oregon.

Known bondholders, mortgagees and other security holders, holding one per cent or more of the total amount of bonds, mortgages or other securities: None.

Average number of copies of each issue of this publication sold or distributed through the mails or otherwise, to paid subscribers during the six months preceding the date of this statement. (This information is required from daily newspapers only.)

(Signed)

E. H. SHEPARD, Editor and Publisher.

Sworn to and subscribed before me this 15th day of April, 1913.

JAY P. LUCAS, Postmaster.

Apple Drying—How to Build Evaporators

By John A. Gibbs, Amity, Oregon

IT is fast becoming a problem of vast importance to the apple growers of this country of how they are going to convert their by-products into something that will bring them good returns for time and money invested. We have now scattered out in a few places in this beautiful valley what we might term apple evaporators working to perfect success. These are composed of a well built building about twenty by forty feet, with two divided kilns, which are built nearly the same as for drying hops. If wood is used for firing, the furnaces should be set in the center of each kiln with six full lines of pipe running under each floor and hanging from above by wires or rods about four or five feet from kiln floor. The floor joists are laid about one and one-half feet apart with flooring of inch strips, which are tapering from one inch to five-eighths on the bottom to give a good heat space between each strip, and are laid very close together to prevent the sliced apples going through the spaces. It is always best, if possible, to locate a building of this kind on a sloping sidehill. In doing this the workroom, which is of vast importance, can be built on a level with the kiln floors, and this saves the work of elevating everything to the kiln floors. It may be built as it is desired, with outside hoppers for apples opening into the workroom where the paring machines are set in place to handle the fruit. The Rival single-fork machines are commonly used and give good satisfaction. The apples are hauled from the orchards and emptied into the hoppers and are worked out by the persons running each machine. After leaving the machine which should only peel and core, the apples pass down a small trough to the trimming table, which is a small table about two feet wide and five feet long, where the rest of the peeling is trimmed off and the wormholes taken out and all rot or bruised spots taken off. They are then placed in the bleacher boxes ready for the bleacher. These boxes

are about two feet eight inches long by thirteen inches wide and seven inches deep, with a slat bottom made of lath running crosswise. A bleacher should be built outside in the open and away from the workroom as far as possible, and yet be handy to both work and kiln room, and should be built to hold twenty or more boxes, with two small doors in front of each tier of boxes and ample space below to place a sulphur pot for bleaching. This space should be about two feet and should be so arranged to slide each box in separately. Ordinary coarse sulphur is used for bleaching purposes, taking about an hour and a half to thoroughly bleach them. There is also a great difference in apples about bleaching. Large, hard apples will take longer. After they are properly bleached and aired they pass to the slicer where they are sliced; each apple by itself is turned to make perfect rings and then

dropped from the slicer into baskets. A rotary slicer is used for this work. After this they pass on into the kiln rooms where they are spread on the kiln floors, and great care should be taken to get them spread evenly, as much depends on their drying well. They should be spread about four to seven inches deep, according to the amount the crew is able to handle after each kiln floor is well covered and ready for firing to start drying.

Then comes the problem of what is the apple-drier man going to do with his by-product to realize a profit from it. That is, what is he going to do with his cores and peelings? They may be dried or made into vinegar as they choose. If they are dried it is getting to be a great proposition to be able to dispose of them and get value received for them, as much of this product must be shipped to foreign lands. If made into vinegar, then there is a demand for more machinery and large vats to hold the vinegar, and also barrels to handle and ship it in. If they are dried they are spread on the floors the same as the sliced apples and must be well shaken up with a fork just before the fire is built, and are bleached by placing a pot of burning sulphur under the floor, the fumes passing up through will be enough to bleach them. This should always be done as soon as the fire is started or the kiln is ready, in order that the sulphur fumes will be all gone before the night watch has to turn the apples, which is done from three to six times a night, according to the size, quality and condition of the apples, whether firm or overripe. It is very hard to say just the exact time of firing it takes to get a kiln of apples ready for the first turn. It should be about three or four hours of good, steady heat of over 200 degrees, and very close watch must be given them to prevent scorching. It is very hard to tell just the condition they are in when ready to turn. It requires

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(A Mutual Non-Profit Corporation)

Headquarters: Spokane, Wash.

April 21, 1913.

Mr. E. H. Shepard, Hood River, Oregon.

Yours of the 19th noted with pleasure and thanks. Last week I spent a whole day and evening re-reading "Better Fruit," with special emphasis on your own article on marketing. If I may paraphrase what Van Dyke said about God and the strawberry, I will say: "Possibly someone might get out a better horticultural paper than you do, but probably man never did." Each single issue is a text book within itself, and is worth several times the price for an entire year's subscription.

Yours very truly,

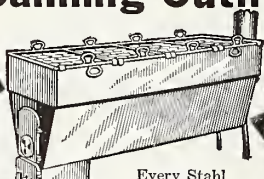
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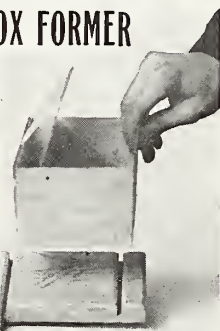
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CLACKAMAS, OREGON

some experience to be able to tell just how and when to handle them. They are turned over with a large scoop, beginning at one side of kiln and throwing over to far side one full course across the floor, then passing back and forth across the kiln, turning them over and smoothing them with the blade, but never pat them down, as they will stick together in large bunches if this is done. Under all circumstances this is done three times a night. This is one of the most important things about drying apples, that is to know how to handle them while in this drying process. Much is done to help them in one way or another by using good ventilation under the sills to give a draft of cool air, or perhaps only part of this space is used, but it should always be at hand ready to open or close as the case may demand, and when nearly dry the fire is allowed to slowly die down until they are taken off. This requires from nine to thirteen hours. A person who thoroughly understands, knows what to do, as there are so many changes in wind or weather that have some bearing on this process, either to promote or hinder it. It is also of great importance to know what condition they are in when they should be removed from the kilns. This is also hard to be explained, but they should not be overdried, for when they arrive at this point they are very easily burned and ruined for sale. Apples placed in this intense heat and nearly dry will have a soft, damp feeling, and when they are cold will be hard as chips. Much may be lost at this time by drying too long, for apples once dried this way and overdried will never take back the weight and be what they would have been. After leaving the kiln rooms they go to the storehouse where they pass through a curing process which makes them all of one uniform condition. This is done by emptying each day's work by itself in the storehouse, which should be shoveled over and well mixed each day until the third day, when they can be mixed with others. When ready for packing, which is a very important part of this work, care should be taken never to pack too soon. When they are ready for market they are packed in sacks or in fifty-pound boxes. Boxes are faced in rows with choice rings and the balance then packed on top of them. If packed in boxes they must be packed and pressed in with a press. These boxes cost about twelve to fourteen cents each. Boxed apples will sell for about one-half cent more per pound than sacked apples.

Some people seem to think that any kind of an apple, good or bad, is all right to dry, but this is not the case, as good drying apples must be firm and hard and of good size. The apple man will fight against everything that will go to waste. The small apples may be worked up into chops and a good profit realized on them. They are sliced and spread on the kilns and bleached the same as waste by placing a small pot of sulphur under them. They are dried

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WRITE FOR SPECIAL FRUITMEN'S LIST OF MARKING SUPPLIES

and handled the same as choice apples only they are sliced whole, peeling and all, making it less expensive to handle the small product and prepare it for the market.

It is found that girls give good satisfaction for the light work, such as trimming apples, and men for the other work, but in all these things the more experienced help that can be obtained the better it is, and the man who starts out to try this system of apple drying should be sure that he knows what kind of a night watch he has, for here is where the success of the whole business hangs, that is, in good and proper drying and not overdrying or scorching of first-class fruit. There should be a connection with the workroom and as handy as possible to it a good apple shed with bins enough to hold about a week's supply of apples. Apples sorted and graded to a uniform size will give the best satisfaction, as they will dry even and bleach better than large and small ones all mixed together. This perhaps will give those interested in this matter an idea of what they must do when such a problem is undertaken. Perhaps many more things will be found out when actually doing the work that I have overlooked at this time.

Canning Waste Products

It is a great mistake when farmers make no attempt to utilize the waste products of the farm. They complain about the inability to market their stuff at a profit, and yet join the ranks of the "dumpers" who put everything upon the oversupplied market, because they think they have no means of storage or transforming into other marketable products. The fruit season is soon on. What are they going to do with what they can't sell at a profit? Feed it to the hogs? Let it rot on the bushes, vines and trees? Carry it to the market and take a song for it rather than haul it home again? They certainly are headed that way unless they have a canning outfit ready to transform fresh fruits and vegetables into canned goods. What does the packing house do with the beef and pork you raise? They can't sell it all as fresh meats. Some they hold in storage, some they make into sausages, canned stuff, pickled stuff—anything to give it a market value. Can't the farmer be as wise? It only costs a few dollars to get a canning outfit so they can have a little home factory and save the surplus vegetables and fruits that later will have values they never dreamed of. They send their boys and girls to the cannery to pick up some spare change when they could employ them at home in the very same business and at a greater profit. Farmers can watch a steam gauge or thermometer, can't they? They can put stuff into cans and follow directions, can't they? Surely they can. Aside from the purely financial benefit derived by installing a canning outfit, there are many other reasons that will appeal to most everyone. For instance, it is popular now to can the

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Is Now Ready for Distribution

Every Shipper, every Association, every Broker, every Commission Merchant of the United States should have one. It is the most complete and reliable credit guide for Shippers and the most valuable reference book from which to make a mailing list (or to use as a mailing list) for Brokers and Commission Merchants. There is nothing else like it; no old line mercantile agency book can supply the requirements of any of this class of dealers as completely and effectively as does the "Blue Book."

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Now is the time to get ready for next season's business, and the first essential in doing so is the "Blue Book."

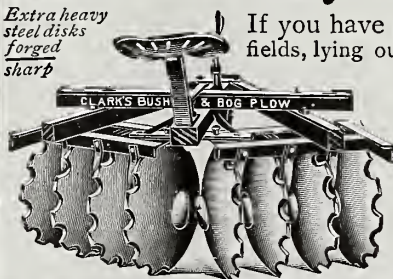
Produce Reporter Company

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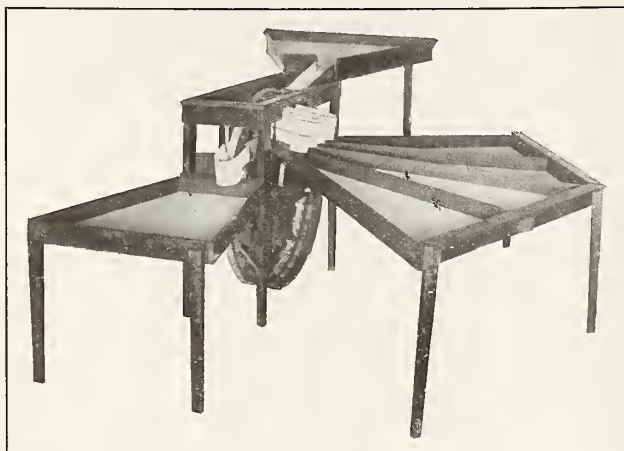
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cornfields for the stock. Silos are going up everywhere. But if stock need canned fodder in winter, or when the fresh, succulent feed is out of season, how much more does the family need succulent foods when fresh stuff can't be got? For \$10 or \$15 you can get a canner. Will you? Write the Bureau of Publications, Washington, D. C., for the latest Farmers' Bulletin, No. 521. On page 25 there are some very interesting facts that will interest anyone who is interested in the purchase of a canning outfit to turn waste into profit. —Contributed.

Agricultural Demonstration Train

An agricultural demonstration train in charge of professors from the Colorado State Agricultural College has just completed a nine-days' tour over the Denver & Rio Grande Railroad in Colorado. The principal subjects touched upon were potato growing, alfalfa production, the growing of sugar beets, dairying and live stock. Twenty-nine stops were made in the principal farming sections and a total of 14,656 people attended the lectures and demonstrations. The appreciation and interest in this kind of work on the part of the farmers of the territory served is best indicated by the fact that the attendance of this train showed an increase of 40 per cent over that of the train last operated, and of more than 300 per cent over that of the trains operated three or four years ago.

Sunscauld

Each spring various growers lose a great many trees from sunscauld. A great deal of the sunscauld that occurs on the bodies of young trees comes in the spring of the year. It seems to be especially bad during the season when the nights are cool and the days are fairly warm. Some growers report the use of veneer as a protection, as it seems to shield the trees from damage. Others resort to the use of cheap slabs or stakes, which they drive on the south side of the trees.

Editor Better Fruit:

"Better Fruit" certainly is one of the best horticultural papers we have seen. Yours truly, Oregon Nursery Company, Orenco, Oregon.

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Made especially for fruit growers, and beginners with small capacity. Price low.

Caps round, square or oval cans—All sizes and cap openings—Heated with gas, gasoline or kerosene—Capacity 5,000 cans per day—One-eighth horsepower required—Space 14 inches by 30 inches by 36 inches—Boy or girl can run it—Guaranteed; dependable—Adjusted from one size to another in a very few minutes.

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Tell us how much money you wish to invest in land; whether you wish to pay all or part cash, and we will write you a personal letter telling you just what you can buy, and will answer any other questions you may ask regarding our apple industry.

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HAND DOUBLE SEAMERS

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Sanitary Cans

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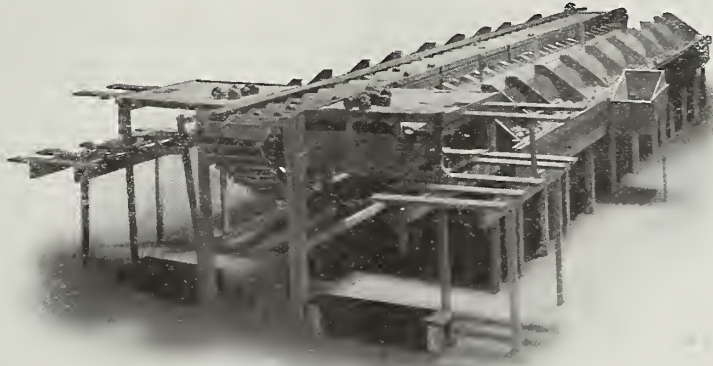
Our Double Seamers

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If you are growing apples for profit you will be interested in the saving in grading, sizing and packing which is possible with a

CUTLER GRADING AND SIZING MACHINE

*Reduces
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*Invest
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ONCE
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The grading, sizing and packing of the fruit are combined into one continuous operation. Two grades of fruit and ten sizes of each handled at once. One commercial size only is delivered to each bin so that an unskilled packer becomes quickly proficient, no further selection for size being necessary.

Floating bins of large capacity prevent overcrowding and make *continuous packing* possible.

It doubles the output of your sorters and increases the packers capacity from 25% to 50%.

Right Now is the time to commence planning for packing house economics for next season. Write today for descriptive circular and prices.

The Hardie Manufacturing Co., 49 North Front Street
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The Horticultural By-Products

By Professor C. I. Lewis, Oregon Agricultural College, Corvallis

ONE of the greatest problems facing the fruitgrower is the question of what to do with the low-grade fruit that will not justify a heavy expenditure in handling. We are coming strongly to realize that it is only going to pay to ship about two grades of apples, and that we must find some other channel for our third grade. Many of these can be used in our local cities, but quite a large percentage of them will have to be worked up into by-products of some form or other. As our crops become larger and larger our percentage of low grades is also apt to increase, and we shall soon find that we have an enormous amount of fruit that will be wholly lost unless we can provide some new channels in which to handle it. The vinegar works, evaporator and canning factory seem to offer the best solution.

The history of the pineapple growers in the Hawaiian Islands furnishes a good lesson to us. Formerly only the slices were canned and thousands of barrels of juice, cores, etc., were lost. Finally someone found that the juice could be bottled, and that the juice paid more money than the slices, but still the loss of cores was tremendous until at least it was found that they made a most excellent glaze, and now this candied pineapple, which is made from the cores, brings more money

than the slices and juice put together. The meat packers of Chicago are said to make their greatest profit out of their by-products. Until very recently the only thing that they lost was the squeal of a hog, but of late they are using that in squealing against the government.

As our associations grow in wealth and power many of them will establish by-product plants. The specimens which tend to run somewhat green and are not overripe will be canned or dried. The fruit that tends to be rather too ripe for such purposes will be made into vinegars, and in such combination plants nothing will be lost. It is true that such manufacture will require considerable capital, but with the increase of our output we shall soon be justified in such expenditures. The problems of evaporating and vinegar manufacture are a big subject in themselves, and in this article I wish to confine my attention almost wholly to the canning phase of the work, as this is demanding the most attention at the present time.

In establishing the cannery, the first thing to consider is the amount of capital. Here is where the average new cannery makes its first mistake. The great temptation is to put all the capital into the plant, spending all the money for building and machinery. Too often

the machinery that is purchased is practically worthless. Unless some money is allowed for working capital, to pay the help, buy sugar, buy cans, etc., the cannery will have hard sledding the first year. Many canneries put up a good building, put in the machinery, run for a few weeks, go into the receiver's hands, bought by a big cannery combine and are closed. We want to avoid such a history as this. Begin in a simple way. In almost any of our cities a suitable building can be found in which to start the work. Start with a few simple pieces of apparatus. It is said that the most successful cannery we have in the Northwest, the one at Puyallup, was started with five hundred dollars' worth of apparatus, and that with this they were able to put up seven thousand dollars' worth of raspberries in a single week. Of course you could put up material cheaper if you had plenty of up-to-date machinery, but many canneries had better get along without the expensive machinery for a few years until they are on their feet.

It takes a lot more money to run a cannery than the average man estimates. Your help are not willing to wait for months for their pay. They will want their pay every Saturday night; and you will have to pay for your cans and sugar, freight bills and

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It is on a swivel and will adjust itself to the load at all angles without any possible chance of **rubbing** or **breaking** the bark or the limb. (In using the stationary prop, such as the **forked stick**, it acts as a pivot on the limb, and 80 per cent of the limbs break right over the prop. Is this not true?)

It costs less and pays more than anything you can place in your orchard, and can be used indefinitely.

Do not wait until your fruit and tree are on the **ground** and then tell us what you **could have saved** by using the Economy Fruit Tree Prop. **Order now for June and July delivery**, for the man who is always waiting never gets anywhere. Price, \$10.00 per 100, and \$95.00 per 1,000.

Sample mailed to any point for 25 cents.

a good many overhead expenses. To meet this you must have a good working capital. One of the best ways to get a working capital is to form a large association and loan money to yourselves. If each member of the association will loan, say five, ten, twenty or thirty dollars, whatever is necessary, and loan this at a fair rate of interest, it will help the cannery to get on its feet. This system was tried at Puyallup, and was tried the past season at Corvallis, and it is working well. To make the cannery pay the biggest profit you must run it as long as possible. If you can run it six months so much the better. It will mean that you are distributing your overhead charges and that the interest on your capital is distributed over a period of six months rather than confined to a single month. If you can run the cannery for a full season it means that you are putting up more produce, that you will have more to sell, that you are doing a bigger business, all of which will mean a larger profit and a better margin of profit.

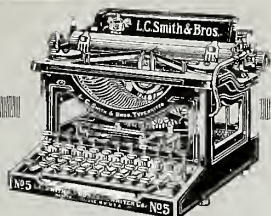
Many canneries make a mistake in starting too soon. They get their building and machinery, but they have nothing to can unless it be a few cull apples, and it is pretty hard to run a cannery on a few culls. You had better try to start popular interest in the cannery several years before your cannery actually starts into operation. Get your people to plant produce that the cannery will need. It is only in this way that the cannery can really pay

the producer a sufficient amount of money so that both the producer and the cannery can live. The reason that more money is paid to growers in California for pears, for example, than in Oregon, is that in California they can count on a large amount of fruit to can, whereas in most of our Oregon districts there is a relatively small amount. Choose, then, a large range of fruits and vegetables which you will put up, but center your greatest energy on those to which your community is best adapted. Some of the crops for you to consider will be asparagus, beets, spinach, rhubarb; berries, such as strawberries, raspberries, blackberries; cherries, both sweet and sour; pears, prunes, apples, peaches, string beans, pumpkins, squash, tomatoes and corn. There is a tremendous demand at the present time for such products as raspberries, blackberries, Bartlett pears, pie cherries. Now, it takes several years for some of this produce to come into bearing, which will mean that during the early years of the cannery the bulk of the produce will consist of some vegetables like beans, pumpkins, squash and beets, together with a few cull apples and pears, and some other fruits that can be picked up. A sufficient planting should be made of these berries, fruits and vegetables so that carload lots can be put up and offered to the trade.

Before attempting to put up anything in your cannery learn what the trade wants. I know of one concern which

this last year put up pie cherries unpitted, whereas the buyers wanted them pitted. Do not can produce with sugar if the trade wants water goods. Do not put up in pound cans if the trade wants gallon cans. Find out what size can they want and how they want the stuff put up and then put it up to suit the trade. Do not put up something that suits you and then try to force it onto the market. Give up the idea in the beginning that you are going to put some fancy produce on the market and are going to have your own label. It takes lots of time and capital to do this—more than the average community can scrape up. Be content in canning for the general trade, the jobbing trade which is found in each city. Find out when the trade buys its supplies. Many a cannery has put up lots of produce only to find that they could not sell it for months, simply because the jobber had contracted for all that he felt it was safe to carry for the time being. Look carefully into the kind of water that is available. If the water is too hard and contains certain chemicals much trouble will be experienced. Such a difficulty occurred in one of our large canneries the past year. Upon opening the cans it was found that the syrups were black, or discolored, and it is very hard to sell such goods. This discoloration was caused entirely by the poor water.

One of the greatest problems in connection with the cannery business is to find the right men to run the plant.



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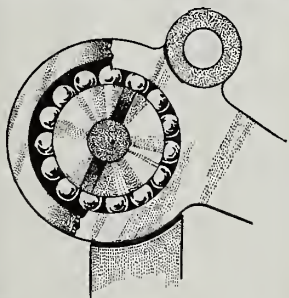
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First, a business manager. The man who has general oversight of the business connected with the cannery should above all be a first-class business man. It is more desirable that he should be a business man than that he be a farmer; and if he is both a farmer and a good business man so much the better. A good cannery expert is very hard to get. A man who understands processing thoroughly, who can handle his syrups and goods well, is really a hard man to find. Many men who have had charge of canneries have handled

only Oriental help, such as Japanese, Chinese, Hindus, and when they are put in charge of canneries with American help they sometimes have a great deal of friction, as the methods used in handling one class of help do not apply to the other.

A cannery is a place where waste is utilized, yet a cannery may be one of the most wasteful plants in the world. A great deal of produce that enters our canneries is destroyed because of a lack of understanding as to the best methods of cutting down this waste. In one of our large canneries in this state the only loss which the cannery met in handling the cherries the past year was that of the leaves which came in the boxes of cherries. The pits were sold. These are bought by nurserymen, and they are also bought by people who make certain essences and extracts. The stems were packed into boxes and shipped to Germany. Nobody knows what the foreigners are going to do with these stems, but the chances are that they will buy our cherries over there, will candy them and prepare them in various ways, will stick the stems back on them and sell them to us for about fifty cents a pound. In many a canning factory there is a great loss from leaky cans. Much of this trouble could be overcome by having a guarantee from the people who furnish the cans. A great deal of this waste material which comes from leaking cans can be utilized in making jams and jells. It is in this way that the cheapest jells and jams can be made, and in attempting to make jells and jams we should try to make them cheap. Apple parings, cores, etc., from evaporating works make the finest jellies.

One of the greatest needs of the average cannery is better bookkeeping. Unless the business manager is careful he will actually sell his canned goods for less than they cost him. I have known of cases during the past year where certain lines of goods were probably sold below cost simply because the manager was not onto his job. As soon as the cannery is well established plans can be made for larger buildings, better machinery, cold storage plants, general storehouses and many features that will make the business more profitable. All through the period in which the cannery is getting established a good newspaper campaign should be carried on, a campaign in publicity and education. The people should be told how to grow the stuff and what varieties to grow. They should be constantly impressed with the great value of the cannery to their community; how it is possible to construct a plant which in a few years may be shipping out hundreds of carloads of products. It will mean employment for a great many people. It will mean one of the best drawing cards to new people to settle in your community. And, above all, it will mean that you will save a great deal of money which otherwise would be totally lost.

Editor Better Fruit:

I am just in receipt of your March number and wish to express my appreciation of your efforts in endeavoring to give your subscribers their money's worth. I consider the last edition worth a year's subscription. Yours very truly, T. C. Foster, Department of Agriculture, Lewisburg, Pennsylvania.

Editor Better Fruit:

I have just read your address in "Better Fruit" with a great deal of interest. Very truly yours, J. S. Cooley, The Missouri Botanical Garden, St. Louis.

Editor Better Fruit:

I consider your valued magazine one of the best, in fact the best in the United States. H. C. Beam, Indianapolis, Indiana.

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CALIFORNIA IRON WORKS
Riverside, California

Description of A Modern Unit Evaporating Plant

By D. W. Seely, Sodus Point, New York

A FEW common sense facts for the benefit of the prospective evaporator man not being familiar with the construction, equipment and operation of an evaporator or dry house of a commercial size. A commercial size dryer is of a capacity anywhere from 50 to 3,000 bushels per day. In all apple-growing sections there should be evaporators to take care of the second-class fruit, not leaving them to rot on the ground and a total loss to the grower. In some cases the evaporated apples bring as much money as the first quality of barrel or possibly boxed apples, but this is not the rule. Until recent years in Wayne County, New York, practically everything was dried, and this made a very fine grade of evaporated fruit which commanded a big price, and still does. Many growers evaporate all their apples and claim

there is more money in it for them, and this is getting to be the general opinion of everybody in this section of New York. One is not so inconvenienced with the labor problem.

I am writing this for the benefit of those parties who desire more knowledge in the evaporating line, starting with the building, equipment and operation of a kiln dryer, the only kind used at the present time. I will start with what I will call the unit size of a commercial dryer, viz., a fifty-bushel plant without power. The plant in question is just across the road, as well as a dozen others that are in sight. The building is a frame one 16x32 feet, with 16-foot posts set on sunk posts for a foundation. The furnace room is 16x16 feet and 11 feet to the joist. The drying floor is made from well seasoned white basswood cut in triangular

strips about one and one-quarter inches on a side with one edge cut off so they will lay flat and not tip over when being nailed to the joist, leaving about one-quarter of an inch of space between slats.

Now comes the most important part of the whole equipment, the furnace and pipe. This plant being equipped with my own make furnace and pipe, I will describe it. It has the Seely Furnace No. 2. The grates are 36 inches net inside the firepot; firepot is 15 inches deep and slopes 8 inches, making it 44 inches through the dome. It is 6 feet 6 inches high and has two ten-inch pipe holes in the top. Three coils of pipe run around the furnace room and join in a 12-inch T at the chimney, which is built in the work room and comes flush on the inside of the furnace room, with a damper on both sides of the T. This is a rather large furnace for this size kiln, but it might better be too large than too small. It is a first-class job and cost \$78.68, of which \$50 was for the furnace and the rest for pipe.

The work room is on the second floor and is 16x16 feet, but the floor is about three feet lower than the kiln. On this floor the apples are peeled, trimmed and sliced. The trimming table is 6 feet long by 3 feet wide, and slopes toward the trimmers, who sit on the opposite side from the paring machine. The table is made sloping so the apples will run down to the trimmers. This table has two machines costing about \$10 each, and one is run on full time, the other half time. Three women do the trimming. The apples pass down

a small spout into the bleacher, where they are bleached for about forty-five minutes with the fumes of burning brimstone; they are then drawn out and either sliced and spread on the kiln floor or set on some outside stoop to allow the fumes to pass off before slicing. Apples should not be sliced and left setting in boxes or barrels waiting for the previous day's apples to come off the kiln, as they begin to leach in a few hours and do not make as nice or as heavy fruit, as it is the sugar that leaches out. It is best to begin slicing after the noon hour, or any time when the kiln floor is empty, and finish the slicing about the time work is done for the day.

I will now describe the bleacher used in this dryer. It is about 6 feet square and 5 feet high, with the floor for a bottom, with an additional slat floor inside made from the kiln slats, with a pitch that will permit the apples to slide or roll down to an opening about 12 inches square and



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Teasdale Fruit and Nut Products Company Plant, Rogers, Arkansas

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about 12 inches above the floor, on the opposite side from the trimming table, where the apples enter the bleacher through the spout above mentioned. I might say that it will be necessary to raise the trimming platform 15 or 20 inches to get the required pitch. The bleacher is divided vertically, thus allowing apples to be drawn first from one side and then from the other, allowing apples to remain 40 to 60 minutes in the fumes of the brimstone. The roof is tight, with the exception of two 5 or 6-inch pipes leading to the chimney to give it good draft, as brimstone fumes are very heavy and require this. The burning fumes are placed under the slat floor, in any metal dish or basin that will hold at least a pint. Care must be taken not to let the bleacher catch on fire.

Now I will describe the handling of the sliced apples after they are put on the floor. I might say that this dryer handles about 90 bushels a day. The slices will cover about 12x16 feet of the floor, the balance of the floor space being used for the waste made during day, which consists of skins, cores and trimmings. These, with the slices, will cover the floor about six inches deep, the maximum depth at which good fruit can be produced. The fire is now shaken down and drafts turned on. It is best to close the cold-air drafts until you get a temperature under the apples of about 175 or 200 degrees, which will take anywhere from thirty minutes to two hours, depending on size of furnace and amount of pipe. After the desired temperature has been obtained open the drafts about half way, allowing them to remain so for two or three hours. By this time it is time to go to

bed; then the furnace is filled with coal with lower drafts shut tight and fire door left slightly open. It would be best to open the cold-air drafts for the night, as the apples must not dry too much during this time—that is, they must not dry enough so they will stick to the floor or to each other very much, for this will spoil the color and give them a bad appearance. They are ready to be turned over in the morning as soon as you get up. This is done with a long-handled snow shovel by starting at the door and shoveling a path across to opposite side. Always keep a clean pair of rubbers by the door to slip on, and use these rubbers when loading the kiln as well as in turning it, as human beings eat these apples, and the future consumption of dried apples depends wholly on their quality. Next turn a furrow away from the wall, throwing the apples pretty well across the floor so you will have enough to fill up the last furrow. Keep them as level as possible and never step on any slices

or waste. It will take about twenty minutes to turn this kiln, and it should be turned at least three times during the forenoon. The apples should come off the kiln anywhere from noon to four o'clock. The apples are shoveled down a spout that empties in the store room under the work room described above; here they should be shoveled over at least three times, when they will be ready for the market. They should feel a little spongy or in such a condition that when a handful is squeezed together they will spring apart and not stick together; neither should your hands feel wet, yet they may feel sticky from the sugar of the apples. Never leave apples on the kiln floor until they are bone dry, for they will crisp up as soon as cold air strikes them. Apples have to be cured the same as hay, so don't be afraid of shoveling them over.

The weight of the dried stock from ninety bushels will average about six and one-half pounds per bushel, or



Teasdale Fruit and Nut Products Company Warehouse, Rogers, Arkansas

Every Canner and Packer

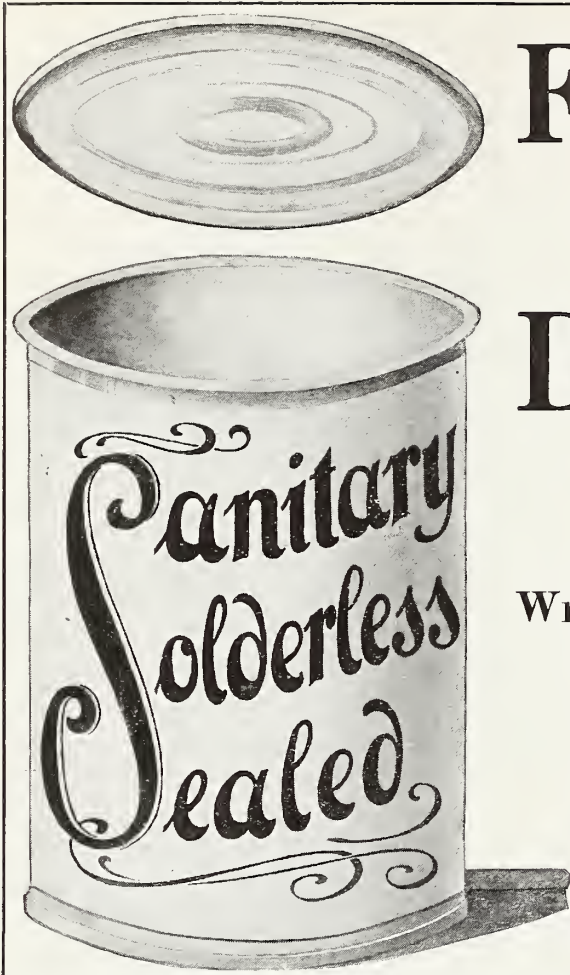
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about 575 pounds, with about half as much waste. The average selling price for the stock made from this dryer this year (which is a poor one) was six cents per pound and the waste about ninety-five cents per hundredweight, making a gross value of \$37.08 for the day's work. The owner has a daily outlay for labor of \$6, not figuring his own time. We can add \$2 for coal and \$1 for oil, brimstone, etc., which will bring his daily expense to about \$9, or ten cents per bushel, which is an average price per bushel for drying apples when delivered at the door. This is not the maximum cost by any means, as it runs as high as eighteen cents and as low as seven cents—the latter figure was attained by the writer and is the lowest figure known by two and one-half cents. As I build all my own machinery, furnaces, etc., and what is bought is at wholesale prices, do not start out to dry apples figuring on my cost of production, for you will be very much disappointed if you do. Now we will figure the owner's time at \$3 per day—that will bring the daily expense up to \$12. Most of these apples were bought for thirty to thirty-five cents per hundredweight—we will say they cost him \$15 for the apples—this will bring the expense up to about \$27, leaving a net income of \$10, not allowing for some apples decaying, which most always happens.

A plant of this size will handle from 3,500 to 5,000 bushels in a season, finishing about the fifteenth of December,

which is fifteen days longer than we ought to run in this climate. The cost of this dryer would be about \$500 here in Wayne County, New York, and a similar one would cost about the same in any part of the United States. It is all made of wood and the inside of kiln room is either lathed and plastered or lined with asbestos paper or plaster-board to retain heat and eliminate fire danger. The area of the cold-air holes should be eight per cent of the floor area and the ventilation in the roof fifteen per cent. Do not try to get along with any smaller dimensions. Any man ought to be able to take this description and build and operate an evaporator without much trouble. The writer will be pleased to answer, through "Better Fruit," any questions anyone may ask.

Scraping and Whitewashing Trees

Often we are asked, does it pay to scrape or whitewash trees? Ordinarily one would say no. The main advantage in scraping the trees is that by this means we often destroy certain insects that are harboring under the loose bark. It also gives the trees a neater appearance when the rough bark is scraped off. Some people like to see the trees whitewashed, although probably more people prefer the natural color of the bark. Years ago there was a tendency to scrape and whitewash the trees every year. Most of the orchards in the Pacific Northwest are

still young and the bark tends to be smooth. It is doubtful if it will pay an orchardist from an economical point of view to scrape and whitewash trees.

Editor Better Fruit:

I have just finished reading an article written by you in the March number of "Better Fruit." I always thought I was a booster for the fruit industry, but after reading this number I find that I have been very tame. I want to say to you in all candor that I never in the same space read as much real good stuff as you had in your leading article; I do not know how to make the compliment strong enough. I actually believe this: If every fruitgrower in the States of Oregon and Washington could read carefully what you have said it would create the greatest possible enthusiasm. I am going to begin immediately to try to induce the fruitgrowers of this section to take your paper. While I am in the mercantile business, I have a twenty-acre Jonathan orchard, and therefore am deeply interested in the upbuilding of the apple industry, which is so vital to all the fruitgrowers of the Northwest. Nothing I could say, and I question if anything anybody could say, could improve on what you have said in the article referred to. I am going to make an effort to have a meeting called of our fruitgrowers and have this article read at that meeting, and I really do not care whether there is any other business transacted at the meeting or not. I believe I would be safe in assuring the fruitgrowers that this article will create more enthusiasm and be of greater benefit than anything they have read or done in years. In my opinion "Better Fruit" is the best edited and contains the best articles on the growing and packing of fruit of any similar paper there is published today. If you care to have me do so, I will be glad to call the attention of the growers to this article and will try to induce them to subscribe to the paper. Hundreds of fruitgrowers are in my store every week and I have an excellent opportunity to see and talk with them. Mr. S. Eaton, a prominent apple man, was in the store this morning. I called his attention to this article and asked him to subscribe to the paper. After reading the article and looking the paper over he asked me to forward his subscription at once. Yours truly, J. F. Slover, Milton, Oregon.

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Continued from page 18

the disposal of our fresh fruits, such as strawberries, raspberries, etc. We hope to use the cannery as a central marketing agency where the growers will bring their berries and other fruits to be sold. If there is an over-supply of strawberries, instead of dumping them all on the market at the local grocery stores, only the best fruit will go on the market. The overripe fruit be made into jam and preserves and the firmer grades will be canned. This will better the condition of both producer and merchant and will give the consumer better fruit for his money.

This leads up to the question of elimination of waste in production and marketing. Last year the prune crop suffered materially from rains just before harvest. These rains caused the fruit to crack badly, making it unfit for drying. In the days before the cannery this would have been an entire loss, but, as it was, several tons of cracked prunes were made into a delicious product and sold at so good a price that some of the growers are seriously considering the advisability of canning more and drying less of their fruit. Again, last year was a fine year for cabbage and everybody raised cabbage, it seemed, with the result that hundreds of tons of cabbage rotted for lack of a market. If the cannery had been in shape to handle cabbage last fall, as it expects to be this year, the crop might have been worked into sauerkraut or have been canned, and have given the growers a fair profit. "There ain't goin' to be no core" might be said of the apples brought to the cannery. Both cores and peelings are used in the manufacture of jelly. Plums of many varieties and even seedling cherries are put up for cheap pie material. Most of the surplus fruits and vegetables grown on the farm can be fed to the cannery instead of to the hogs and the returns will be larger.

An institution, like a man, can hardly be said to be successful unless it is something of a public benefactor. Can we say at the end of a year that the cannery has been of public good? We think so. A year ago farmers and fruit-growers were dependent financially upon local supply and demand, and many of them were victims of unscrupulous dealers. Most of them were getting very small returns on their capital invested and the eyes of many were deadened by hard work without hope. Since the organization of our association, farmers from all parts of the country are brought together frequently to listen to advice about growing and marketing products and to compare notes with each other. They have broadened mentally; the world within their reach, through co-operation, is larger; in their eyes gleams the light of hope—hope that the future may bring a proper recompense for toil, hope that their families may have more of the good things of life, hope that the children may be properly educated and started well on life's journey.



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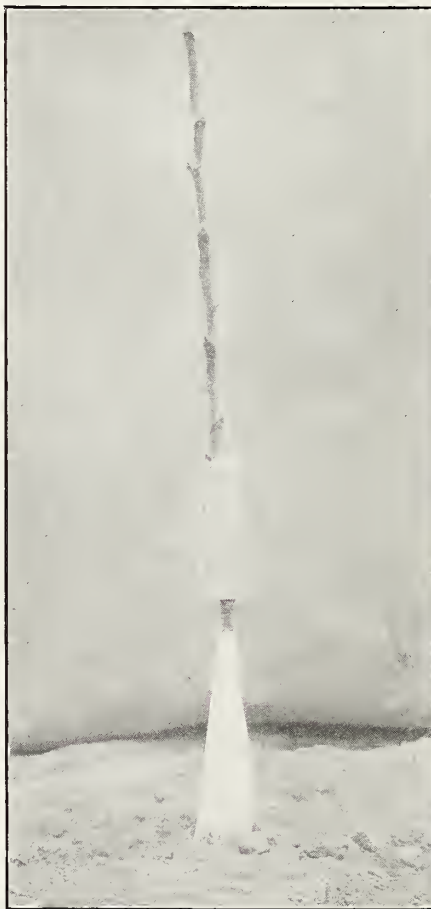
By J. J. McDonald, Salem, Oregon

THIS is a very busy time for us who are in the loganberry business, with the stringing of wires, setting posts and getting ready to take up plants and put up canes on the wires, which I always leave down until spring, feeling safer from frost or freezing, as was the case about four years ago. Nearly all those who put their canes up in the fall lost their crop that season. My vines or canes lay on the ground just as we left them after taking off the old canes after the picking season and were protected from the cold and freezing that happened that winter, which may not occur again for some time to come. However, by mine being left down I got a crop of over four and one-half tons per acre of green fruit, giving me over three tons of the dried product. That year I sold for twenty-two and one-half cents per pound. I have never sold for less than that price. Last year I sold for twenty-five cents and some for twenty-six cents. Last year the canneries paid four cents for all they bought, which, I think, is a price that should be an inducement to all who have small tracts of land to set out to loganberries as well as other small fruits, such as strawberries, raspberries, etc. Now, as I stated that four cents per pound green is a good price, or even three and one-half cents, which I think will be about what they will pay this year from what I can learn so far, but even at three and one-half cents per pound, figuring four and one-half to five and one-half tons per acre, one can readily see that it is a profitable fruit to grow.

Now as to drying. I have always dried my berries regardless of what the price green has been for more than one reason. First, if they are dried I do not have to put them on the market at any certain time to save them—they will keep. If anything happens with the cannery that they are over-stocked for a day or more, the green berries will have to be dumped out, as they mold very soon in crates. A second reason for drying is that the loganberry does not get the flavor or sugar in it until it is ripe, and then is when it weighs most and when the canneries

want them. I figure that it almost pays for the drying by the extra weight from the time most of them pick for the cannery and up to the time we pick for drying. They should be thoroughly ripe for drying, but not so ripe that they begin to get soft. I have been drying loganberries for four years and have never lost one crate of berries in that time. We began drying in what is known as the "Stack Drier." We were unfortunate the first year. Our drier burned down during the prune drying season. We had saved our berry crop and about half of the prune crop. After the fire I began looking at different

evaporators to find, if possible, something more economical in the way of fuel and labor. By spending some time looking over the different kinds of driers I found one in Polk County that I thought came the nearest my idea for both prunes and loganberries. I decided the long tunnel was the thing I wanted. We had to have a drier by the first of July for the berry crop. Several of my neighbors tried to discourage me in the long-tunnel drier, telling me we could not get the draft, but I went on and built a four tunnel, the tunnels being 34 feet long, holding 120 trays, each ten trays high and



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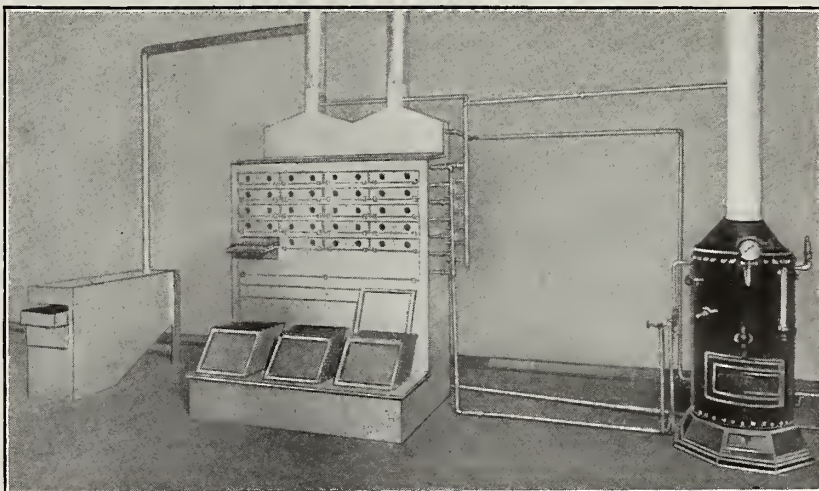
AGENTS WANTED

twelve trays long. My trays are 31 by 27 inches, but that is a matter of choice. They can make the tunnels for any size tray they want. I put my trays in the tunnel the long way of the tray and crosswise of the tunnel so as to get twelve in the length of the tunnel and ten high. They can be twelve or fourteen high if one likes, but we do not like lifting too high, and I think 120 to the tunnel with four tunnels, making 480 trays, leaving twenty-eight inches for finish at the lower end of the tunnel, is very convenient. This space can also be utilized for keeping up all dories in prune drying, and for any extra stuff one wants to dry when the tunnels are all full. In those extra cells we dry pears, apples, beans, cherries, corn or anything that we want to dry, not interfering with the regular tunnels at all, and that makes room for 508 trays, which I figure is all that two men on the shift can handle and do right. In prune season we average through the season about one and one-quarter tons every twenty-four hours, which I figure is enough for four men, two to the shift. We have never yet been able to get enough loganberries to run steady twenty-four hours, usually keeping them up by running daytime, sometimes keeping up the heat for fourteen or fifteen hours, then letting it go down until morning. If we had the berries to run full all the season, two shifts, we could handle twenty to twenty-five acres of berries, or 120 to 125 tons of green berries, twenty-five tons dried. There are about twenty-five driers within one mile around me, most of them stack driers. Some of the parties who advised me not to build the tunnel drier have since built exactly like mine and would not go back to the stack drier. I dry prunes with three-quarters of a cord of wood per ton of dried fruit. I dry loganberries with one and one-half cords of wood to the ton of dried product. With prunes it is about one of dry to three of green, with loganberries one dried to five, or to one-half green weight. If the tunnel driers are built right one saves in fuel and it is much more convenient to handle the fruit. If one has lots of fruit to dry they can just as easily have more tunnels. Since I built my drier we have built several more in the country like it, and none of them would change back to the stack drier. I do not have time myself to go away from home to build them, but I have a son and brother who are building them. I will build three this coming season. I just had a man from California who has 100 acres of prunes at Cloverdale and is going to put up a nine tunnel like this one of mine. He was up here last week to look over the different driers and came to mine last and decided to build like it. I have it so arranged that we can use just one tunnel if starting when the fruit is just beginning to get ripe, or we want to slacken up to save what is ready to dry. Just start one tunnel and only use what fuel it requires to heat that one. As the fruit comes on we open up another and so on, without

This Should Interest You

NEW VACUUM PROCESS FOR Evaporating Fruit and Vegetables

One of the greatest problems confronting fruit growers and orchardists today is the question of how they may turn to profitable account second-class fruit, windfalls and culls, for which there is no market, as well as for first-class and perishable fruit when the market is "down" or overstocked.



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The Luther Vacu-Dehydrator or Evaporator is designed to be built in units of uniform size and capacity, so that additional units may be easily added or attached at any time when increased capacity is desired, and are furnished complete, either with or without peeling, slicing and other accessories.

All of the past and present day methods of "drying" or evaporating fruit are more or less antiquated, inefficient and crude. There has long been sought some improved way or process of preparing fresh or perishable fruit so that it would keep and still retain its most desirable qualities and be salable.

W. M. Luther, a practical mechanic with an experience and observation of over 30 years in the building and construction of fruit evaporators, has at last solved this problem. By applying an entirely new idea, the basis of which is the vacuum principle, Mr. Luther has invented, perfected and placed on the market a device which

WILL DEHYDRATE ALL KINDS OF FRESH FRUIT PERFECTLY

and by means of which the moisture only is taken from the fruit, rendering it in condition to keep almost indefinitely, at the same time **RETAINING ITS FLAVOR, COLOR** and other desirable qualities to a

degree not heretofore obtainable by any other evaporating process.

The treatment of fruit by the Luther Vacuum Dehydrator is different from all other evaporating processes, is absolutely sanitary, and is equally successful in rainy and all kinds of weather. The apparatus is simple of construction and operation and is

GUARANTEED TO PRODUCE A PRODUCT IN EVERY WAY SUPERIOR IN APPEARANCE, COLOR, FLAVOR AND KEEPING QUALITIES, AND IN LESS TIME AND AT LESS OPERATING EXPENSE THAN ANY OTHER PRACTICAL EVAPORATING DEVICE ON THE MARKET.

This process is also particularly adapted for dehydrating hops, sweet corn, potatoes and many varieties of vegetables.

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We are now in a position to furnish and install either standard or specially designed plants of any desired capacity, in any part of the country, under a positive guarantee that the **LUTHER DEHYDRATOR** will do **ALL** that is claimed for it in a satisfactory manner. Prices and terms upon request.

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Price, sample postpaid, \$2.00, or \$20.00 per dozen, f. o. b. Jacksonville. Your money back if not satisfied.

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References, Dun, Bradstreet or any Bank in Jacksonville.

wasting heat for three or four when only one or two is in use. We figure for prunes about 30 to 32 hours, heat at 175 degrees. For loganberries about 24 to 26 hours, heat 150 to 160 degrees. I find in drying any fruit we get better results not to carry too high heat. I think a lot of fruit is damaged by drying too quickly. Thirty-six hours for prunes is better than thirty. Any fruit is better being taken off under the highest heat.

Last year the loganberry growers, what few of them are in the business, were undecided as to what best to do with the crop. The canneries got anxious for loganberries and started out to buy them for three and one-half cents, but could not get what they wanted so raised the price to four cents. They went to the biggest growers north of Salem and contracted all they could get. I have been drying all of the berries south of Salem for four years. They came to me and tried to buy mine green. If I sold green there would be no drying in this section, as they would take all the berries. I could not see any way to keep up or spread the market for the dried berries unless some of us dried, so I refused the price and dried mine, also for about fifteen different people, from a few crates up to six and seven tons green. Last year I dried in green weight 37 or 38 tons, a little over seven tons of dried fruit, which was distributed over different parts of the country. I will dry again this year, whatever the price may be green. Four cents green will figure out about twenty-five cents for the dried, so it pays to dry even at twenty cents. Nothing will pay as well on the same amount of ground. Five tons per acre at three and one-half cents green per pound would be \$350 per acre; then, if figuring one-half for expenses, leaves \$175 per acre net. What can beat it? At three and one-half cents green—we will say that we dry them at twenty cents per pound—five tons green or one ton dried per acre, at \$400 per ton, would be \$400 per acre, so I figure it out that it is good profit to raise loganberries and to dry them. One other thing which will help to keep up the loganberry industry is the juice, which in the near future will be used extensively and be far ahead of grape juice. The only thing is to get the loganberry introduced. In every part of this country where they have grown loganberries more are wanted each year. We must spread the markets, as there are a great many acres put out each year. Last year I sold 24,000 or 25,000 plants and this year I have orders for 40,000, some going to Washington, up on the Sound, and some to Los Angeles. The 40,000 plants that I have orders for is not a sprinkling of the plants that have been sold this winter from other places around Salem. As the loganberry industry grows the market must be broadened. There are so few parts where the loganberry can be grown successfully that it does not look to me that it will be overdone.



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C. C. MORSE & CO.
 61 Jackson St., San Francisco, Cal.



Cider and Vinegar Plants, Canneries, Evaporators

By W. H. Paulhamus, Puyallup, Washington

I WAS very much pleased to receive a letter from the editor of "Better Fruit" inviting a short article on the marketing end of our fruit products. I realize that a fruit magazine of the standing of "Better Fruit" can be of great assistance in pointing out to the growers that growing the fruit is only part of the industry, that after the fruit is grown it must be sold at a profit to insure a permanent industry. In my judgment, our people of the Northwest have been devoting too much of their time to planting trees and selling real estate and not enough of their time in establishing a market for the fruit after it is grown. I believe that the year 1912, with its low prices, has been one of the best things that has happened to our apple growers, for it will give us an opportunity to "stop, look and listen." It doesn't make any difference how high class our fruit is if we are unable to sell it, but we all realize that a large percentage of the fruit grown on the best handled orchards is second, third or fourth

class, and in fact some of it might be better designated as culls. It is a much easier task to sell the 40 per cent high-class fruit than the 60 per cent of the lower class under the existing conditions. The market for our high-class fruit has been developed in a small way, but the marketing of the large end of our crop, up to the present time, has been entirely overlooked.

I am satisfied that we must give our attention to evaporating plants, cider and vinegar plants and canning plants. This is not a pleasant condition to face, but it is a real condition and not a theory. It is a well established fact that the greatest percentage of the output of California is of the dried product, and we growers of the Northwest must make a study of the various methods through which we can market our fruit before the industry will be on a permanent basis. From what I can learn, many of our hop houses can be used after the hop season for the purpose of evaporating apples, prunes, pears or berries. If this is correct the

expenditure in establishing the evaporating end of the business will not be very heavy, as there are now erected in a great part of the Northwest a sufficient number of hop kilns to handle a very large volume of evaporated fruits. But in order to do the work properly a study must be made of the evaporator work done by other growers of like fruit. Every farmer cannot handle his own fruit successfully, but with a little intelligence we can ascertain how other evaporating plants have been conducted most successfully and what changes are necessary to apply to our own conditions.

The writer of this article does not pretend to give advice on the question of evaporators, on account of no experience along this line, but it does occur to me that a very small amount of money would enable any community to put some live, energetic citizen in touch

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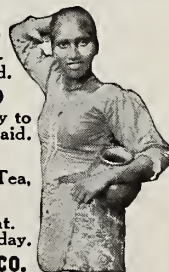
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Canning fruits and vegetables is the solution to low prices and the tremendous waste in fruit and vegetables at the ripening season. You may guard against this costly waste if you own a "NATIONAL" Steam Pressure Canning Outfit. Only a very small investment is required, which is many times paid back on the first season's pack.

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Farmers and fruit growers who have adopted the "Steam Pressure Method" are realizing nice profits. You can make money by canning what you raise and selling it later at store prices, when the articles are scarce. This is no experi-

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"NATIONAL" Steam Pressure Canning Outfits will preserve anything you grow, both in glass jars and cans.

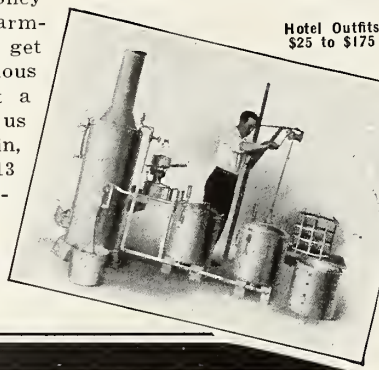
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Let us tell you the money-making opportunities for farmers, fruit growers, etc., to get greater profits; for ambitious men and women to start a profitable business. Tell us what you are interested in, and we will send you 1913 literature showing our complete line.

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Canvassers and Agents are making big money selling "NATIONAL" Outfits. Territory is going fast. Write for our "Quick Sales Plan."

Hotel Outfits
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with the most modern methods; and by modern methods I don't wish to be understood as advising an expensive plant. It is my judgment that just as good results can be obtained from inexpensive plants as from those that cost large sums of money. We must learn how the evaporated fruits are packed so as to sell to best advantage, what conditions are necessary to protect against the common enemy, the transportation question, where markets are available, and the most important point—how do the buyers de-

sire the fruit handled? In other words, what suits the grower might not suit the buyer, and the buyer is the one person that must be considered.

A large quantity of our fruit can be handled successfully in canning plants, but I believe that the cannery is a more expensive manner of taking care of the by-product than is the evaporator. Yet I believe that we should have both, because it gives a double outlet for the product as compared with either line. And while we are considering evaporating plants and canning plants, we must first of all guard against the professional builder of plants of this kind. Many of us recall the bad results obtained from having the professional promoter build the original creameries. It is a very easy matter to raise the money to build such plants, but it is very frequently a hard task to get a manager that will make good. What is everybody's business is nobody's business. If we select a manager on the ground that he is a good fellow and has no enemies the chances are that he is also a man who does not produce results.

I believe that the secret of the success of the fruit industry in the Northwest today depends very largely upon our ability to turn the attention of our chambers of commerce to the necessity of taking care of the people that we have as residents of the Pacific Northwest today instead of giving their attention to the residents that they hope to have next year. We have plenty of

machinery, in a business way, to make a success of this industry if it is harnessed up right, but if we will continue to pursue the policy of spending all of our money and all of our energy seeking new settlers and overlook the settlers that we now have we never will have much of a country. I don't wish to be understood as being opposed to new settlers. I believe they are very necessary and essential and will prove a mighty good asset, but if we lose old settlers as fast as we gain new settlers we have not accomplished very much,

WANTED

A position in the fruit industry, by a well-trained Eastern young man 24 years of age. Has a Master's degree in Pomology from N. Y. State College of Agriculture at Cornell. At present engaged in teaching fruit growing in an Eastern university. Address W. H. D., care of "Better Fruit."

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Seeks permanent employment on large fruit farm. Seven years' experience in Germany and ten months on large fruit farm in Oregon. Good references. Address "Orchardist," 335 Morris Street, Portland, Oregon.

Growers of a full line of nursery stocks, etc. Apples, pears, prunes, peaches and cherries. Send in your want list and secure prices.

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Land, irrigation and orchard schemes examined for owners, buyers, bonding companies or advertising agencies—Orchard and land values estimated—Orchard soils examined—Directs orchard development—Land damage claims estimated—All business confidential.
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Position Wanted

By young man as manager or superintendent of large commercial orchard. Two years' college training in horticulture, three years' practical experience. Can produce results. Best references. Address H. J. S., 46 East Long Street, Columbus, Ohio.

and to keep from losing the settlers who are now here we must help them make a success of their business. I realize that the transportation companies have been extremely helpful in many ways, but I do not believe that they grasp the situation from a standpoint of permanency and the solidity of the people who are now residents. If we could get the grange and other farmers' organizations to put in their time studying the market conditions of their products instead of giving all of their time to changing the present method of running our government I believe it would be a step in the right direction. Being a member of the grange, I have listened to many most able talks upon the referendum, the recall, the parcels post and similar very important matters, but have not had the pleasure very frequently of listening to an address on the possible price of a ton of potatoes. I trust that "Better Fruit" and other similar publications will continue to call our attention to the fact that we must help the man or woman who is now trying to make a living on the farm, so that they can continue to stay on the farm instead of keeping our eyes entirely to the East.

Rabbits and Mice

Every year a great many trees are lost from the attack of rabbits and mice. This is especially true in the regions where the land is newly cleared and a great deal of brush or uncleared land is in the vicinity. Many remedies have been tried in fighting the rabbits. Some growers report that the lime and sulphur spray thrown around the bodies of the trees seems to keep them away. Others claim that rubbing the bodies and main branches of the young trees with hog or sheep liver serves the same purpose. Mice generally hide in grass or straw which is in close proximity to the young trees. Sometimes they are controlled by painting the trunks of the trees with whitewash which contains arsenic or some similar poison. When trees are badly wounded by mice or rabbits and you detect the wound quickly, the best thing to do is to pare the wound smooth and cover it quickly with grafting wax. If you can get to the wound before it has dried out it will often heal over nicely from this treatment. Some growers paint the wounds over with shellac. Where the trees are completely girdled and the wound becomes dry one of two things should be done. Either the trees should be bridge grafted, which simply means inserting a scion below the wound and also above the wound (the scion is trimmed on each end to a chisel point and this is inserted in a cut made through the bark both below and above the wound), or where the trees are very young if they are cut off below the wound they will often send out a new sprout.

Editor Better Fruit:

Enclosed please find money order for \$1.50. I would not be without "Better Fruit." Manager Belgian Orchard Syndicate, Vernon, British Columbia.

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Dry Your Lower Grade of Fruit in a

SEBASTOPOL FRUIT EVAPORATOR

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You are not buying for this year or next alone—but for years to come. With it you have a guarantee that it will do the work as it should be done—year after year—and the guarantee is by a manufacturer whose reputation for high quality and fair dealing has been known the world over for more than half a century.

"How to Spray, When to Spray, Which Sprayer to Use"

An interesting and valuable book that tells about sprays and sprayers, gives valuable formulas and complete spray calendar. We want everyone who sprays to have this book. Free.

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tells about Goulds pumps, spraying materials, pruning tools and other things of interest to growers, and will be mailed free, together with the Goulds and Corona books.

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Contains nothing but lead oxide and arsenic oxide. Superior to all other arsenates of lead—dry or paste. Stays mixed longer without settling. Spreads more evenly. Sticks to branches, leaves and fruit. Mixes quickly and easily in water. No sediment, lumps or waste. Never clogs spray nozzles.

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The first—and only—satisfactory arsenate of lead. Simple, clean and easy to handle. Cannot freeze, dry out, cake, or lose its strength. Combines convenience, economy and efficiency. Always a uniform strength of spraying solution. Positively kills and exterminates apple worm and plum curculio and all leaf-eating insects. Only one pound to fifty gallons of water. The great ORCHARD SAVER. Write for figures, testimonials and sworn tests.

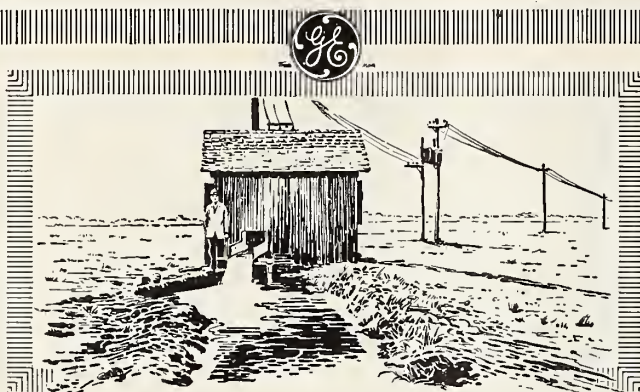
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Portland Seed Co.

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The use of electric power saves time, labor and cold cash—that has been proved to be just as true on the farm as in town. Its economy increases your profit—take advantage of it to do your irrigating better and cheaper with one of the many types of

G-E Electric Motors For Farm Use

Here are some of the reasons why so many fruit growers, stockmen, gardeners and general farmers now use G-E Motors instead of other forms of power.

Water can be used when and where you want it. No extra help is needed as G-E Motors need no watching and they work 24 hours a day. As G-E Motors have few parts—repairs and wear amount to practically nothing. G-E Motors can be controlled a mile or more away—from house, barn or wherever you choose. G-E Motors do not increase your insurance cost—they do reduce your fire risk.

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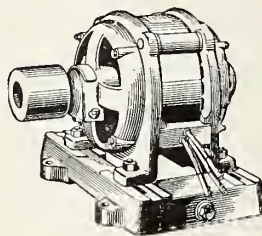
Again, electric service provides light to shorten the long evenings and illumine the gray mornings.

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Write to the nearest office of this Company.

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Prepared Maraschino Cherries

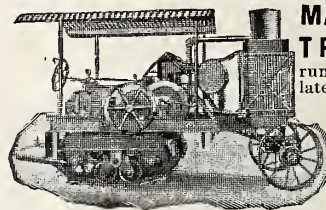
By Professor C. I. Lewis, Oregon Agricultural College, Corvallis

THE preparation of maraschino cherries is carried on almost exclusively at Bordeaux, and it may be said that this product is manufactured for export only. In fact it is rarely to be found on sale in France and none of the grocers of Marseilles, the second largest city in that country, keep it in stock. It may be added that the importance of this industry has decreased considerably in recent years owing to the successful competition of American manufacturers, who prefer to import cherries packed in brine instead of the finished article. The cherry employed is that known as the "Bigarreau Napoleon," an elongated fruit, easily

stoned, which is grown in Provence. It is used when fairly ripe, that is to say, no longer green but not sufficiently ripe to be eaten, because then it would not bear transportation, and it is first subjected to the fumes of burning sulphur for a period varying from eight to twelve hours, according to the nature of the fruit. As a result of this sulphur bath it loses its original color, being bleached externally and internally, and it becomes more susceptible to the penetration of the syrup and alcohol in which it is to be preserved. The cherries are then stemmed and stoned and heated in the same manner as "candied fruit." The sul-

phuring and heating processes are the same as those described in Consul General Washington's excellent report on "Glacé Fruit" (see Daily Consular and Trade Reports of February 24, 1909, No. 3414), the difference being that the fruit is subjected to only three heatings instead of eight or more required for the other product. The cherries are heated in a syrup at 24 to 26 degrees Baume (degrees of concentration). After the third heating the fruit is carefully sorted and only the perfect cherries and those of uniform size retained. They are then placed in bottles. A sugar syrup is used to which from 10 to 15 per cent of alcohol at 50 degrees is added. The alcohol is perfumed before application by the addition of from three to four per cent of marasque water, which is intended to perfume the fruit and give it the flavor of maraschino. After about fifteen days in bottle the fruit is ready for expedition. The cherries are colored with the "Erythrosyne superfine" coloring matter authorized by the pure food law, this colorant being added to the syrup at the moment of heating. About ten grams (0.35 ounces) of Erythrosyne are used for 100 kilos (220.04 pounds) of fruit. The "Bigarreaux en saumure," or cherries in brine, are packed in a solution of three or four per cent of salt and sulphur, and have been subjected only to the sulphuring process. They are shipped in barrels to the United States. They are preserved in the above solution until the manufacturer is ready to treat them further. They are then washed, boiled, colored, etc. The marasque water used is generally purchased in the Grasse district, and is obtained by extracting from crushed cherries and their stones, with

KATERPILLAR TYPE NO SLIP, ONE MAN FARM TRACTOR



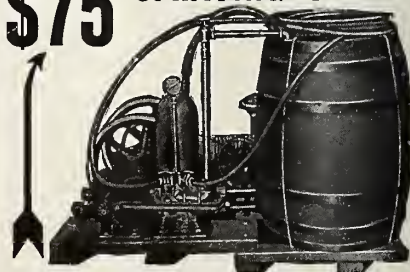
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the addition of alcohol at ten or fifteen degrees. Less scrupulous firms obtain it by crushing bitter almonds, but this process yields an inferior water, though the flavor is similar to that of maraschino water. The foregoing information concerning prepared cherries was kindly communicated by a Marseilles exporter who was at one time engaged in the manufacture of this product.

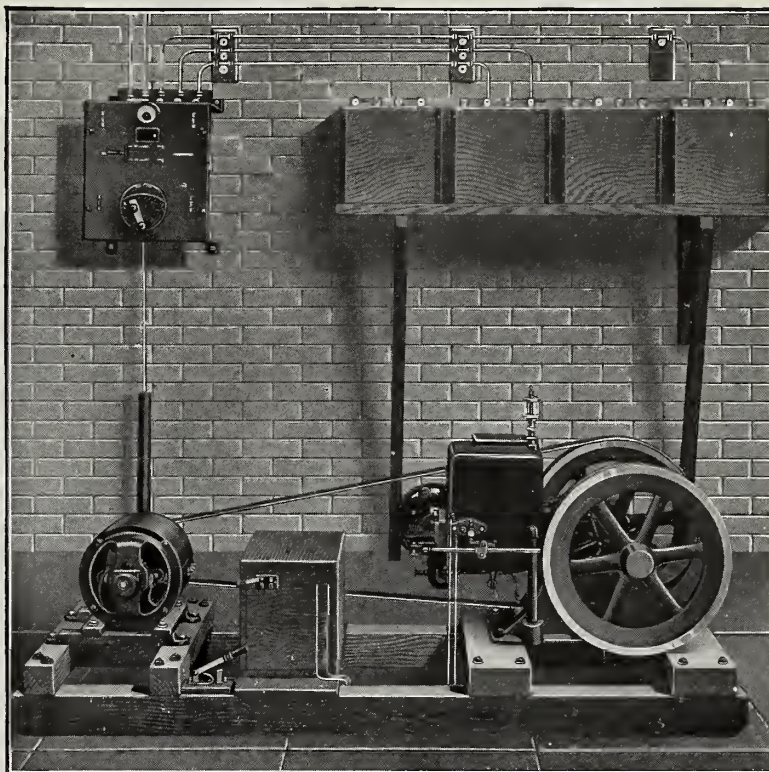
Consul A. K. Moe of Bordeaux writes as follows on this subject: "The cherries known as "Bigarreux" are placed in an oven and subjected to the fumes of sulphur until they have completely lost their color. Upon removal they are sorted and the stones removed. They are then cooked by immersion in water which is heated by steam until all traces of sulphurous acid are eliminated. When cooled they are placed in large copper cauldrons which are heated by steam; these cauldrons contain molten sugar, and the cherries are allowed to remain in the solution about two minutes. After the removal from this bath they are left to drip and cool, and thereupon are again subjected to the same immersion, dripping and cooling process. "Erythro-syne" is added to this sugar bath in order to restore the original color of the fruit, which was lost in the preliminary sulphur bleaching. The product is then set aside to cool during twenty hours. Thereafter the cherries are bottled and covered with a syrup of sugar candy and marasque sugar. The bottles are hermetically sealed and covered with metallic capsules and submitted to a sterilizing process in a steam-heated cabinet."

Mr. A. E. Doolittle, acting chairman of the U. S. Department of Agriculture Board of Food and Drug Inspection, writes me as follows: "In reference to the use of sulphur dioxide in these cherries, I can give you no definite information at the present time as to what will be the final action of the department. The question of the use of this substance in food products is being investigated by the referee board. Pending the decision of this board no objections are being made to its use. The cherries are picked when they are hard and firm and about half ripe. They are bleached with sulphur dioxide and packed in brine containing SO₂. This treatment is used to preserve the cherries in shipment, also to open up the pores, so that sugar will be more easily absorbed. The manufacturers import cherries from Italy and from any country where they can buy them cheaply. In the manufacture of the finished product there seems no reason why the large bulk of the sulphur dioxide could not be removed."

Factories for the manufacture of maraschino cherries are located in Cincinnati.

Food Inspection Decision 114 is as follows: "The question of the proper labeling of the product designated as "Maraschino Cherries," "Cherries in Maraschino," "Bigarreau au Marasquin," etc., has been presented to the board for consideration, and after due

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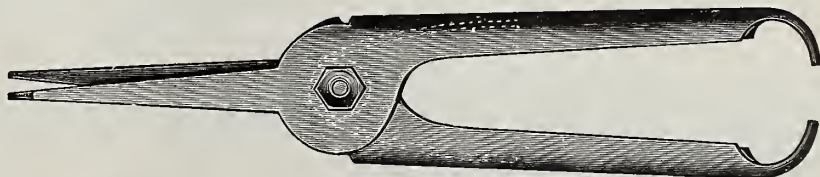
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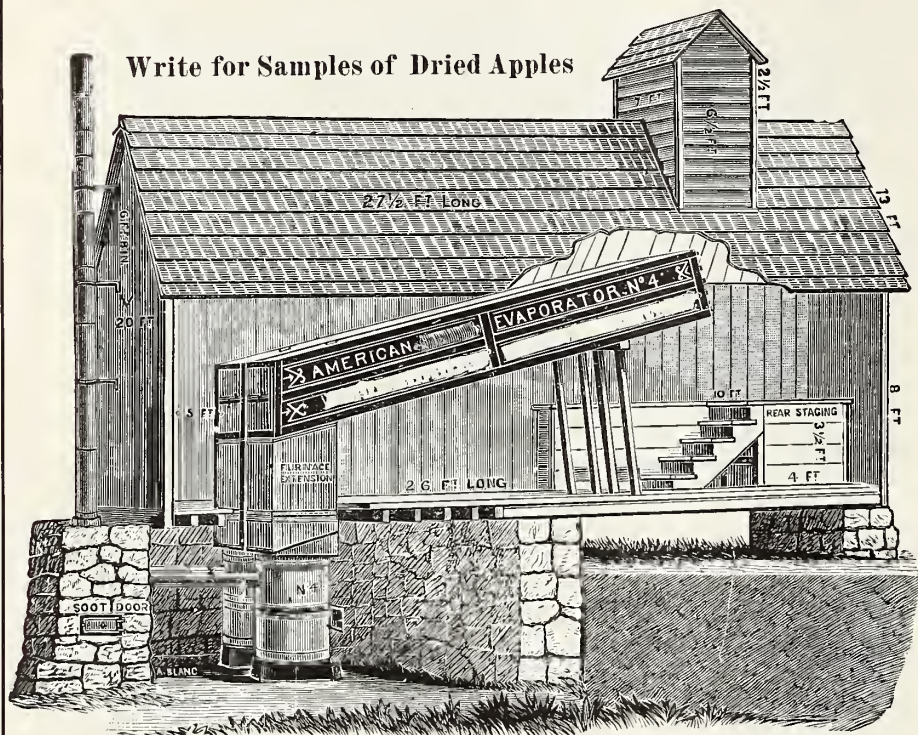
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investigation and examination of the evidence secured the board is of the opinion that the term "Maraschino Cherries" should be applied only to the marasca cherries preserved in maraschino. Maraschino is a liqueur or cordial prepared by process of fermentation and distillation from the marasca cherry, a small variety of the European wild cherry indigenous to the Dalmatian Mountains. Liqueurs or cordials prepared in imitation of maraschino with artificial flavors or otherwise will not be held to be misbranded if plainly labeled "imitation" in some manner to show their true character. In considering the products prepared from the large light-colored cherry of the Neapolitan Bigarreau, or Royal Ann type, which are artificially colored and flavored and put up in a sugar syrup, flavored with various materials, the board has reached the conclusion that this product is not properly entitled to be called "Maraschino Cherries," or "Cherry in Maraschino." If, however, these cherries are packed in a syrup, flavored with maraschino alone, it is the opinion of the board that they would be misbranded if labeled "Cherries, Maraschino Flavor," or "Maraschino Flavored Cherries." If these cherries are packed in maraschino liqueur there would be no objection to the phrase "Cherries in Maraschino." When these artificially colored cherries are put up in a syrup flavored in imitation of maraschino, even though the flavoring may consist in part of maraschino, it would not be proper to use the word "maraschino" in connection with the product unless preceded by the word "imitation." They may, however, be labeled to show that they are a preserved cherry, artificially colored and flavored. The presence of artificial coloring or flavoring matter, of any substitute for cane sugar, and the presence and amount of benzoate of soda, when used in these products must be plainly stated upon the label in the manner provided in Food Inspection Decisions Nos. 52 and 104. The same principle applies to the labeling of cherries put up in syrup flavored with creme de menthe or other flavors."



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Look Good, Taste Better, Sell Best
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Apple Growers' Union
Hood River, Oregon

Fruit Canning—Methods, Etc.

Continued from page 14.

may occur early. The heat used in processing may have been insufficient to kill the vegetative forms or spores, but may have injured them to such an extent that time was necessary for recovery and subsequent development. A microscopic examination of the material a few days after processing, or of the incubating cans during a short period, might not show anything wrong. It is only by incubating samples for a number of days that early recognition can be made of some cases of spoilage or possible spoilage. The canner often sends his goods from the factory with full confidence in their condition, and it is not until after they have been in the broker's warehouse or upon the grocer's shelves many weeks, or even months, that he becomes aware that anything is wrong. The spoilage may amount to only one can to the case, or the percentage may be high; but in either event the goods are rejected with loss.

Spoilage from the use of improper material—i. e., material which has been allowed to stand until fermentation has begun—is generally more or less sour to the smell and taste, but is sterile, the heat of processing having killed the bacteria.

Can leaks may occur along the side, "seam leaks"; at either end, "end leaks"; at the cap, "cap leaks"; at the tip, "tip leaks"; or may be due to defective tin plate. Can making has reached such a point of perfection that manufacturers guarantee all above two to the thousand. These imperfect cans are usually due to the solder not making a perfect union or to defects in crimping or double seaming. With the use of the automatic capping and tipping machines there are fewer leaks than formerly occurred when the work was done by hand; leaks in sanitary cans are generally due to poor adjustment of the rollers. Leakers are recognized as a rule by inspection in the hot bath, few getting into the ware-room. Leaks may be very small, even microscopic in size, and therefore difficult to detect, or pieces of the can content may be driven into the opening and seal it for the time. Leaks invariably cause swells. A check on spoilage can be kept by placing a few cans from each day's run in a room kept at a high temperature (98 degrees), as these will incubate much more rapidly than if kept in a storeroom.

There are two conditions known to the trade as "springers" and "flippers." A springer is a can the end of which will bulge slightly after a time, but on opening there is found neither gas nor spoilage, though the cans have the appearance of being swells. This condition has been found to be due to overfilling or to packing cold. Such goods when placed in a warm grocery will bulge, due to the temperature. A flipper is a springer of such mild character that the head may be drawn in by striking the can on a hard object. It is always possible to tell a swell from a



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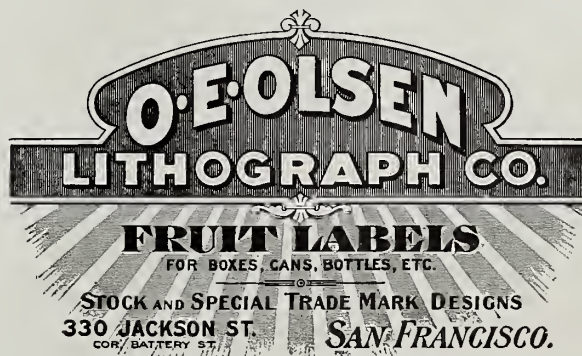
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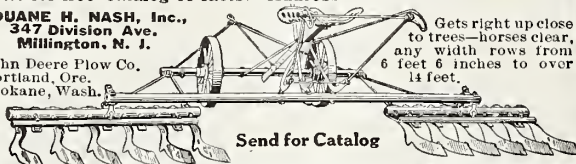
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springer by the use of a microscope, as in the former there will be large numbers of organisms, while in the latter there will be very few.

While a spoiled can of food should never be eaten, the danger of poisoning from fruits and most vegetables is very remote. Ptomaines or other poisons may form in meat, milk and fish, but rarely, if ever, in vegetables.

Canned foods may be injured by an excess of either heat or cold. Some products are injured more than others. The effect of prolonged heating is to cook the contents to a pulp. This is seen at times, in the case of peas and tomatoes in particular, when the cans have been stacked tightly before being fully cooled. The liquor will become cloudy from short heating, thick and heavy from prolonged heating, and the peas softened and broken if it is continued for a number of days. The writer has seen peas stacked that were warm for three weeks after packing. Tomatoes become soft and pulpy, and often turn a walnut brown if stacked hot and the heat is retained. All fruits become murky and lose their distinctive flavor and odor. Canned foods will stand the high temperature of summer very well, but as far as possible they should not be placed in the hot sun nor kept in a very hot storeroom. The effect of moderate heat is not nearly so marked as might be expected.

Cold seems to have no ill effect upon canned goods unless it goes below the freezing point. Most canned foods will stand a little freezing without appreciable change. Repeated freezing and thawing cause the goods to become flabby and give a flat taste. In all cases the interior of the cans show a distinct attack upon the tin. With fruits, the coating of the cans is made to appear as though it were galvanized. Canned foods will resist a fair degree of heat or cold without serious injury, but continued heat or a very high temperature, or repeated freezing and thawing will cause deterioration in quality.

Foods properly prepared and kept under reasonably good conditions deteriorate very slowly, so that cans carried from one year to another may be as good as or better than the latest pack, depending upon the comparative quality of the fresh product used. On general principles, however, it is desirable that a product should not be carried over several seasons. The amount of tin dissolved also increases with time, which is an additional reason for not holding canned goods any longer than is absolutely necessary.

It is not possible to accurately estimate the amount of home canning that is being done, but it must aggregate many millions of cans. In the rural districts in particular it is considered to be a part of the season's work to put up canned foods for the winter, and from 50 to 100 cans is no unusual stock for a family. The products canned are usually fruits and berries, as these are the most easily handled under home conditions. The household department of numerous weekly papers give much space to instructions in home canning,

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and many cook books give recipes and details of the operation. There are also manufacturers of small home-canning equipments that give glowing accounts of the profits to be made from doing such work. Whether it is profitable to can for home consumption depends upon the cost of the raw material, fuel and labor. It may be said that it is not generally profitable to buy fruits or vegetables in a city market and put them up in cans. Lots of a bushel, half bushel or crate generally lack the necessary freshness, are in too small a quantity to permit of grading and there is too much waste. The labor involved is disproportionately large for the amount handled, and the expense for cans and sugar must not be omitted in determining the cost of the finished product. Home canning may be profitable when the raw stock costs little or nothing, when no account is taken of the labor, and the satisfaction of having one's own handiwork is worth more than the money value of the article.

Home commercial canning is being encouraged to a certain extent, and whether it will prove profitable or not will depend upon local conditions. The outfit needed for canning most fruits and tomatoes is very small, and where a crop cannot be marketed except at a very low price or the labor cannot be otherwise advantageously employed a fair profit may be obtained. The canning of special articles or putting them up in a certain way for an established trade is often successful, but on standard articles like tomatoes, corn, peas, string beans, etc., the chances of home canning in competition with a modern factory are about the same as those of a hand meal grinder as compared with a modern grist mill. The product of the average home cannery will grade in quality on about the same par as country butter. Both depend upon the producer, but as a class neither ranks very high. The small home cannery is useful in saving good food which would otherwise go to waste, and its development should be encouraged, but the idea of large profits should be held in abeyance. For the novice and many others it would be better to learn how to buy the best prepared foods rather than to attempt to pack them.

In making a comparison of the cost of canned and fresh products of the same kind a number of factors must be taken into consideration. First, the cost of the raw material and the waste when purchased in the small quantity used in a single meal; second, the cost of labor and preparation used in making it ready for the table. It is obvious

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that a comparison cannot be made for time, as the canned article may be had throughout the year and the fresh for only a limited season, and purchase of a product out of season is usually at a high cost. In making a purchase of either the fresh or canned article, the smaller the quantity the higher the price; the single can costs more than if bought by the dozen or case, as does the half peck of apples compared with the bushel or barrel.

Take, for example, a No. 3 and a No. 10 can of whole apples. The former usually retails for 10 cents and the latter for 25 to 30 cents. Those who can use the latter have a decided advantage, as it will contain between four and five times as much as the former. Only in apple districts, and for short seasons, can the same quantity of the fresh fruit be purchased at the same price. Whenever the fresh fruit sells at the rate of two dollars per bushel when purchased by the peck, and this is below average prevailing prices in cities, the canned article is the cheaper. In the raw stock there is loss in peel and core, from bruises, short weight and often rot, all of which is eliminated in the can. The canned variety usually cooks better, and for the pie or dumpling is generally the cheaper.

Neither corn nor peas can be purchased in large cities, nor in many smaller ones, as cheaply as in the can, and then they are not so fresh. In up-to-date canneries the article is put up the day it is picked, while three or four days may elapse from the time the raw product is harvested in the garden (in transportation, in the hands of the commission house and in the grocery) before it reaches the consumer's table. It requires nearly two quarts of good peas in the pod to make one can, and often more than three quarts of the heavy-podded variety found on the market. At no time can the smaller peas nor fine-kerneled corn be purchased as cheaply as in the can. It requires two pecks of good peas to yield one No. 2 can of petit pois, or one peck to yield one can of extra sifted, and from four to eight ears of small corn to make one can. The pea and corn packer, however, handles tons of these crops especially grown for him, and uses the highest class of automatic labor-saving machinery in all operations, so that the real labor on a single can is very small. The consumer cannot purchase peas at from 30 to 50 cents per bushel, nor corn at \$9 to \$12 per ton, and these represent initial costs in large quantities. In fruits, as berries, the consumer must figure that a No. 2 can will require not less than 12 ounces of well-selected fruit, and for a No. 2½ can 22 ounces. The latter is equivalent to two boxes of berries by the time they are picked over. Syrup is added to the can, which offsets the sugar necessary for the fresh fruit.

There is a vast difference in canned foods, and, as in many other lines of commerce, the cheapest in price is often the most expensive. The can of water-packed tomatoes, the green hard pears, the handful of berries in a pint

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of water, or poor quality beans disguised with tomato dressing and offered at a low price, when measured by their food value are the highest. Goods which are strictly standard should give the best food value for the cost. Peas, corn, beans and tomatoes which are good field run, but which lack the uniformity and niceties which are necessary for the fancy article, will have all the nutritive properties and be just as palatable, but cost several cents less per dozen. There is much that is pure fad in the purchase of canned foods; the asparagus must be white and the fewest possible stalks in a can; the green is just as good and a medium number of stalks furnish a more edible product. The little peas are, naturally, the costly ones, for less than five per cent are of that kind; the large one are the better flavored and more nutritious, and one-third the cost. Similar examples might be cited of a number of other products. Canned foods should be purchased by the dozen or case, straight or mixed lots, rather than by singles cans.

Detailed Consideration of the Various Products

Fruits are the easiest of all articles to can, boiling for a short period being sufficient to sterilize in nearly all cases. Formerly it was the practice to pack all fruit in No. 3 cans, but within the past few years a change has taken place; Eastern fruits, especially the high grade, are put up in No. 2 cans. The apple is the one exception to the rule. California fruits are packed in No. 2 and No. 2½ cans, the No. 3 can being almost wholly supplanted by the smaller size. In displacing the No. 3 can, the open-top can has been substituted for the solder top, with the result that the cans may be filled with less injury to the fruit and may be sealed full. The quantity obtained in the No. 2½ open-top can is in most cases equal to or more than was obtained in the solder-top No. 3, and it is in better condition. In the canning of fruits the general practice is to fill the can level full, or nearly so, without crushing, and then add the necessary syrup. The syrup will abstract a certain amount of juice, so that the can will not be full upon opening, and this condition will vary with the different fruits. The softer the fruit, such as strawberries, the less will be the fill, while hard fruits, such as pears, will be scarcely affected. The question of fill will depend in part upon the variety of the fruit used, the state of maturity, the density of the syrup and the time of processing. The proper selection and handling of the fruit so as to get a can with all the desirable qualities distinguishes the real canner. The weight of fruit used in a can will vary somewhat when the fill is made by volume, as the interspaces in the case of large and small fruit or soft and hard are not the same. In order to secure greater uniformity it has been proposed by one of the packers' associations to fill all fruits by weight, 21 ounces for a No.

WARD SPRAY PUMPS

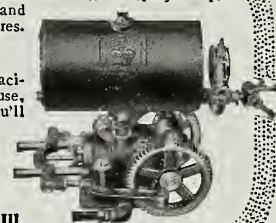
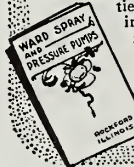
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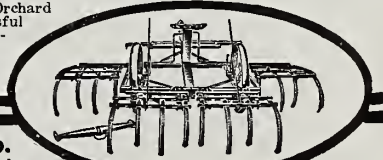


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2½ and 22 ounces for a No. 3 can, before cooking. This is a fair average fill for small or sliced fruits, but peaches in large pieces or whole pears, plums, etc., will weigh less. In the packing of high-class fruits syrup is used, and this may vary from a very light to a heavy syrup, or between 10 to 60 degrees. Most fruits require the addition of sugar before they are used, and it should be added during cooking, and in canning it has a great deal to do with the development of the proper flavor. The water pack is used only upon the poor grades or pie stock. The amount of sugar used will depend upon the acidity of the fruit and the flavor desired. It is unsafe to follow a rule-of-thumb method to get the highest class goods; and as the real flavor will not develop until the foods have been put up for some weeks it requires an expert to determine the proper syrup.

Apples used for canning should be of such varieties as cook well. They should be slightly acid, smooth and sound, and without bruised spots. Poor apples cannot be used in canning and make a first-class product. The peeling is done by hand or power peelers and the core removed by the same operation or with a coring machine. Apples which are intended for dumplings are left whole and graded into size to give a certain number to the can, but those intended for pies or other cooking purposes are sliced in quarters or smaller pieces. The peeled apple is placed in cans as quickly as possible and hot water added to make the fill. If the apples cannot be packed in the can at once they are held in tubs of cold water to prevent their oxidizing or turning brown. The process on apples is about eight minutes at 212 degrees Fahrenheit for No. 3 cans and about ten minutes for No. 10 cans.

Apricots are produced almost exclusively for canning in California. They are grown and handled the same as peaches, though not quite so carefully, and are graded for size by running over screens having openings of forty, forty-eight, fifty-six, sixty-four and sixty-eight thirty-seconds of an inch, respectively. The ripe apricot is not peeled as a rule, but the skin is well wiped either by hand or machine, after which the fruit is pitted. The canning operation is the same as for the peach, though the syrup used is generally lighter. (See peaches.)

Blackberries should be given the same kind of treatment as raspberries, though they are more solid and will stand being handled in larger volume. They do not require so heavy a syrup. (See raspberries.)

Cherries should be brought to the factory in small boxes just as they are handled for the retail trade. They should be stemmed and then washed. The California fruit is graded for size over screen having openings of twenty-two, twenty-four, twenty-six, twenty-eight and thirty-two thirty-seconds of an inch. The cherries may or may not be pitted, but generally it is preferable that this be done. The new ma-

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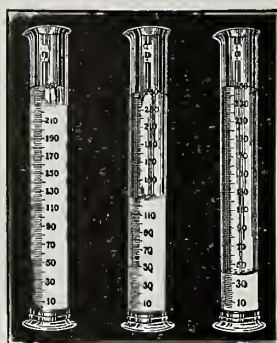
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chines do the pitting rapidly and well. The cherry rests in a cup-shaped opening and the seed is forced out by a small cross-shaped plunger. There is naturally some lacerating of the flesh, but not more than is usual in the pitting by hand. After the cherries have been pitted they should not be permitted to accumulate in masses of more than two inches in depth. The quantity should be weighed for each can and a heavy syrup added, or they should be heated in a preserve kettle and filled in the cans hot. The latter method gives a better fill, but breaks or tears the fruit to a greater extent. The enameled can is preferable for this fruit. The process is eighteen minutes for a No. 2½ can. White cherries are usually canned without pitting, and in a lighter syrup than is used upon the red.

Few gooscherries are canned, and these are largely used for pies. The berries are gathered when nearly ripe and are handled in baskets and shallow boxes. The first operation at the factory is to remove the stems and brown blossom ends. This was done formerly by running them over a vibrating screen upon which was directed a strong blast of air. This removed part of the blossoms and stems, and the remainder were either rubbed off by hand or were passed with the fruit. An improved gooseberry cleaner consists of a slitted disk, below which parallel knives revolve. The berries are poured above the disk and made to roll over and over by light dragging chains. This causes the stem or blossom to fall into the slits, where they are cut off close to the berry. The berries are then washed and filled into cans by weight. Those intended for pie making usually have only water added, while those for the general trade have a syrup. The filling, exhausting and capping are the same as for other berries.

Grapes have not been used very extensively for canning purposes, but there has been a noticeable increase in the past few years. In the East the white variety is used almost exclusively, but on the West Coast both the white and the colored grapes are canned. They are gathered when the flavor is fully developed, but the fruit is firm. The bunches are hand picked, washed and put in cans to within one-fourth of an inch from the top. A hot syrup is added, the cans are exhausted and then closed. The process is about fourteen minutes at 212 degrees Fahrenheit for a No. 2½ can. In California the grapes are also graded by size, being run over screens having holes twenty, twenty-two, twenty-four and twenty-six thirty-seconds of an inch in diameter. The sizes thus separated are not indicated on the label and the consumer is unaware of this refinement except as it is indicated by the price.

The peach is one of the most popular fruits canned and the quantity so used is enormous. It leads all other fruits in value. The principal packing is done in California, New York and Michigan. In California the lemon cling, or some one



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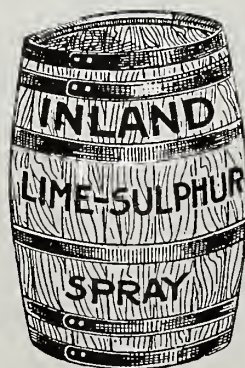
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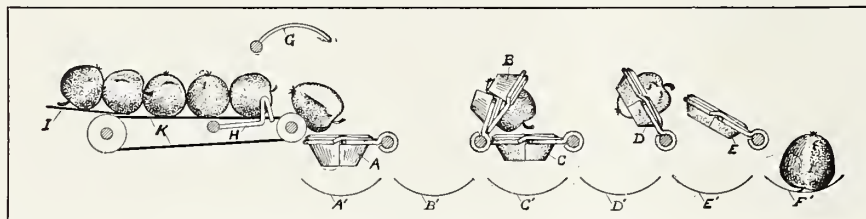
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of its varieties, is the favorite, while in New York and Michigan the freestone variety is preferred. The growing, picking and handling are the same as for the market; that is, they are hand picked just before turning soft and handled in crates or baskets. The conditions for growing peaches are so favorable in California and they acquire such size that they are purchased on the basis of being two and one-quarter inches or more in diameter, those below that size being received at a reduced price. The Eastern packers cannot make such close discrimination. If the peaches are well ripened they are run through the factory at once. If they are under-ripe or hard they may be kept in a cool place for a time. It is the practice of some to pick the peaches over each day and take them out when at their best, but as a rule they are held until all can be used at the same operation. Holding the fruit in cold storage is not advisable, as the flavor is impaired. Some varieties of peaches are graded for size before peeling, and this is done on an orange grader, the space between the rolls being adjusted to deliver three, four or five sizes as desired. When the lye-peeling system is used the grading is generally done after peeling. The holes in the screen are sixty-four, sixty-eight, seventy-two and seventy-six thirty-seconds of an inch in diameter, which, with those that will not go through the largest opening, gives five sizes. Careful grading for size is almost wholly limited to the California product.

There are three methods of peeling: By hand, with the knife; by steaming and slipping the skin, and by the use of lye. There have been some machines devised for peeling, but they have been used but little. The knife used for hand peeling is provided with a somewhat curved blade and a guard to limit the depth of the cut. This is the method used almost exclusively in the East and on a portion of the California pack. After the peach is peeled it is split along the line of natural cleavage and the pit forced out in the freestone or removed with a pit spoon in the cling varieties. Peeling by means of steam is possible with only a few varieties. This method consists in splitting the peach, removing the pit and placing the halves in a single layer, split side down, in a tray which has a covering of cheesecloth. When the tray is covered the cheesecloth is folded over the peaches and the tray slipped into a steam box. The peaches are heated in this way for about three minutes and then the skin may be slipped by picking it up between the fingers. This method involves very careful work, but results in a handsome product. When the lye system is used the peaches are first split and pitted and the halves placed in special machines containing hot, weak solutions of caustic soda or lye. They are carried through just fast enough to allow the peel to be removed, the time usually being twelve to eighteen seconds. As soon as they emerge from the soda solution they are

thoroughly sprayed and are kept under sprays or in water until they are placed in the can. Where the lye peelers are installed, the peaches are usually delivered to the filling tables, graded into sizes, as already indicated, but the fillers sort for quality, separating the pieces perfectly ripened, those unevenly ripened or defective in color, and those imperfect in form or in quality. With these different grades 60, 50, 40, 30 and 20-degree syrups are used. In addition peaches are canned in slices, and while formerly it was the practice to use the imperfect halves and small sizes for this class, now equally as good stock is used and syruped in the same way as the halves. There is a grade of water or pie peaches made from the lower grade stock. The cans are filled by weight. One of the best factories using the steaming system to loosen the skins placed the peeled peaches on pie plates and weighed the quantity necessary to fill each can. The plate was washed every time it was used. Hot syrup of the degree desired is added to each can until it is full. It is exhausted for three minutes and processed for twenty-five minutes at boiling temperature.

Pears used in canning are generally grouped in two classes, hard and soft, the former being represented by the Kiefer and the latter by the Bartlett. While the Kiefer yields very well, the consumption is small, largely because of the poor quality; the Bartlett is better, but often the label does not adequately tell the story. The canning of pears is similar to that of canning apples. The work of peeling, coring and halving, however, is done by hand. Considerable care is taken in trimming to a symmetrical form and in removing the core to cut away only so much as may be necessary to remove all trace of seed cells. They are graded in three classes, dependent upon size or number of pieces required to fill a can, and uniformity of shape and texture. This is done according to the judgment of the filler and not by machine. They are put into cans the same as apples and a syrup is generally used instead of hot water, as it retains the flavor much better. The process is sixteen minutes at 212 degrees Fahrenheit for No. 2½ cans.

The classes of plums are generally quoted on the market as green gage, yellow egg and Lombard. Other varieties are used, but these are the popular ones. The plums are selected when just ripening. On the Pacific Coast they are graded for size by running them over screens having openings thirty-two, forty, forty-eight and fifty-six thirty-seconds of an inch in diameter. They are washed, put in cans with syrup and processed fourteen minutes at 212 degrees Fahrenheit for a No. 2½ can.

Raspberries are grown and harvested the same as for the market and should be delivered to the factory in berry boxes. At the factory they are handled in exactly the same manner as are

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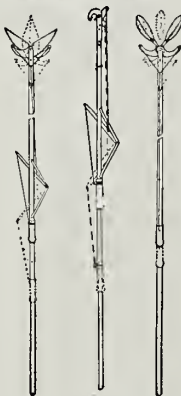
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strawberries. Red raspberries and black caps should be kept separate. Columbia berries are regarded as inferior in appearance to Cuthberts, being less bright in color, but they have excellent flavor. The use of a syrup of the right density has much to do in bringing out the full flavor. The cans should be enamel lined to retain both color and flavor. The process is twelve minutes at 212 degrees Fahrenheit.

Strawberries used for canning are grown the same as for market, and such varieties as are firm and of uniform size should be used. They should have a well developed flavor, a little more acid than is desired for eating raw. They should be gathered the same as for the market, in boxes holding not more than one quart, and preferably only one pint, the object being to deliver them in the best possible condition, without bruising or mashing. A distinctive method of handling berries on the Pacific Coast is in a chest of shallow crates. These chests are well made and hold four tiers of five trays each. Each tray measures about eight inches wide, fifteen inches long and one and one-half inches deep inside. The boxes holding the berries are therefore very shallow and there may be two or more in a tray. The fruit arrives at the factory or market with the minimum of bruising. On arrival at the factory different methods are followed, but one of the best, as practiced by one of the large packers, is as follows: The boxes are delivered to tables, where they are turned out upon enamel pie plates. The berries are stemmed, defective ones sorted out and any foreign substance removed. The plate containing the berries from a single box is passed to another helper, who washes the fruit under a spray; the next one weighs each plate and adds the correct amount to fill one can. The berries are poured from the plate into the can, in which operation a special half funnel is sometimes used. The can should be filled a little above the level. Hot syrup is added and the can given a two-minute exhaust, sealed and processed for fourteen minutes at 212 degrees Fahrenheit. The cans should be preferably enamel lined with open tops.

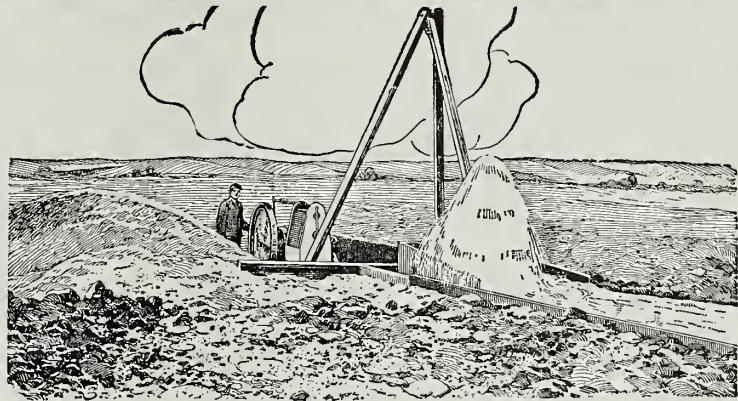
In the handling of the fruit at this plant the pans are washed after each separate usage. The work involved is greater than in some other systems, but the product can hardly be excelled in cleanliness and in flavor. At some other plants the berries are stemmed from the baskets and are run through a fruit washer to remove any leaves or dirt; they are then filled directly into cans without weighing or are collected in large pans, and when a sufficient quantity has accumulated are then put into a preserving kettle with sugar and heated until they just come to a boil. The berries and their syrup are then filled into the cans. Strawberries do not admit of being handled by automatic machinery. The stemming must be done by hand, but in the plate system they are not touched after once being washed. In the system in which

considerable dependence is placed upon the fruit washer the cleaning is well done and in a manner not to injure or break the fruit. Cans which are well filled with cold fruit will not be full of fruit after processing. The heat causes the breaking down of the tissue and consequent loss of juice, so that the berries will float. Berries heated with sugar in the preserve kettle will give a better fill in the can, as more juice is cooked out than can be returned to fill the space between the solids. In this practice there is a distinct difference between the manufacturer who attempts to give a can with the maximum of food solids and the one who cooks the berries to abstract the juice for other use, such as fruit syrups for soft drinks. A syrup should be used in all cans, as it holds the flavor much better than water. Sugar is always used with such fruit, and the proper time for its application is when it is being cooked. The degree or density of the syrup is a matter of taste, but preferably it should be fairly heavy. The enamel-lined can is decidedly the best for preserving flavor and color, and also for resisting the action of the fruit on the can. Strawberries are also put up in glass and given the same general treatment.

Small Fruit Patch

In the spring of the year some attention should be given to small fruits. The currants and gooseberries should be well pruned. Some states claim that in pruning currants all wood over two years of age should be removed. Here on the Pacific Coast, however, the three-year-old wood is often the best bearing wood for the currant bush, and almost invariably the three-year-old bearing wood is the best on gooseberries. Whether one should remove the wood at the end of the second or third year depends on the kind of fruit produced and the growth the shoots are making. Aim to grow good, strong bearing canes each year. If the wood is getting weak cut out all such wood and cut out the new weak wood and limit the number of canes that you allow to grow. Probably a dozen canes would be the limit. Wood ashes sprinkled around gooseberry and currant bushes seems to be beneficial. Cultivate the patches well in the spring, giving good tillage up close around the plants. This will help to control the berry worms. The later blooming varieties seem to be freer from worms than the early bloomers. The London market currant is especially free from the worms. This currant is coming into more favor on the Pacific Coast.

A small strawberry bed should be found in connection with every orchard. If the bed has been running for six or seven years and is running out it will pay to establish a new bed. Buy the best plants you can possibly get hold of—good, strong well-rooted plants. A few plants of this kind are worth more than hundreds of poor, spindling plants that are often offered



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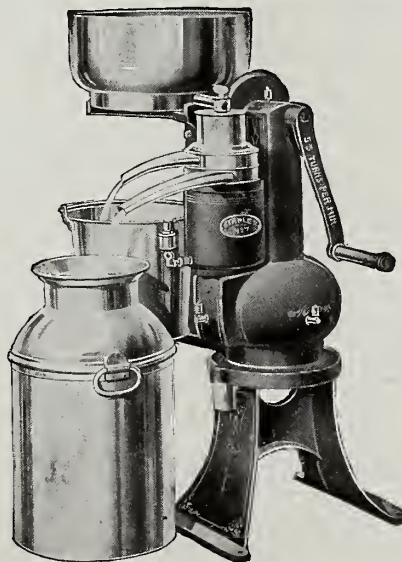
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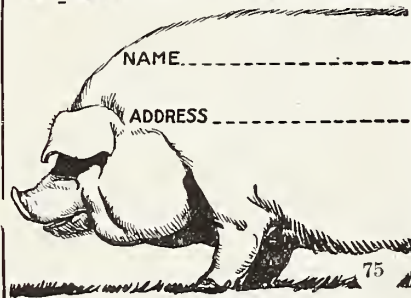
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for sale. Then give the ground good thorough preparation. Work the strawberry bed early so as to get ahead of weeds. If the plants have not been growing well a light application of hen manure or wood ashes, or some good commercial fertilizer like nitrate of soda or dry blood in small amounts will tend to strengthen the plants. In applying the commercial fertilizers do not allow them to come in contact with the foliage, as they will burn it very badly. An application of a hundred pounds to the acre will be sufficient. This should be put on early in the spring, and can be sown broadcast and cultivated in or put on in the form of a liquid. We often hear the statement that strawberries should not be tilled much when they are in bloom or as they are ripening the fruit. The reasons for this are that the strawberry roots are very shallow and there is danger of cutting off the roots. This cutting of the root area reduces the amount of sap that the plants obtain and thus may have an influence on the bearing. The Clark Seedling, in some sections, is the best berry to plant. Other berries that are especially good for home use are the Gold Dollar, Sixteen to One and Magoon.

Cashmere Recommendations

The Cashmere Fruitgrowers' Union elected a board of directors, which adopted the following six recommendations to be submitted to the members: "1. To eliminate the tier-sizing system of counting apples and to use numbers only. 2. To permit no apples smaller than 150s in the extra fancy grade. 3. To permit no apples smaller than 175s in the fancy grade. 4. To remove the color requirement on a perfect (physically) apple for admission to the fancy grade but to retain the extra fancy color requirement for the admission of a blemished apple to this grade. 5. To pack but two grades—extra fancy and fancy. 6. To move at once to establish some means of absorbing the third grade."

Yakima County Horticultural Union

The Yakima County Horticultural Union last year sent three representative fruit salesmen to the East to sell direct to the dealers. The result of this policy proved so satisfactory even under the adverse conditions of 1912 that the union has decided to follow the same policy during 1913, and will again place their own salesmen in the field. We understand that these salesmen met with splendid success in opening up new markets and creating new customers for the union in addition to those they already had.

Netted \$1.08 Per Box

Mr. G. W. Coburn, manager of the Wenatchee Fruitgrowers' Union, when in New York, as stated by the Produce News, said, "the association up to January 1 netted the growers an average of \$1.08 per box." Since that time, Mr. Coburn states, the prices have been somewhat lower.



Red Cross Dynamite

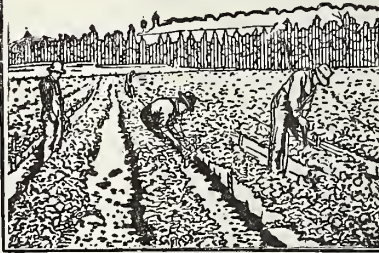
UPPER view shows how big stumps are completely blasted out and shattered into kindling wood. At the same time, subsoil is thoroughly broken up, creating the best conditions for maturing crops. Lower view is the \$800-per-acre celery crop growing on former stump land, in less than a year after clearing.

FREE BOOKLET

Explains how to safely and profitably use Red Cross Dynamite for blasting stumps and boulders, tree planting, ditching, subsoiling, excavating, road-building, etc. Write for name of nearest dealer, or expert blaster, and Farmers' Handbook No. 338

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Origin of Some Names of Fruit

The Baldwin apple was named after Colonel Baldwin, a civil engineer. While engaged in his work in a place called Butters Row, near Wilmington, Massachusetts, his attention was called to an apple tree by a noise made by a woodpecker. He found the apple to be of excellent flavor, and afterward it was named after Colonel Baldwin. Grimes Golden is reported to have been named after Farmer Grimes, who originated the variety. The Phillips cling peach, which is used more extensively in California than any other peach for canning, was originated by Mr. Joseph Phillips, who was for many years nurseryman for the editor's father in California. The Thompson seedless grape, the great raisin grape of California, was named after Mr. Thompson, who lived a few miles from Marysville, the birthplace of the editor of "Better Fruit." Mr. Thompson received this grape among a few varieties from the government for trial, which were imported from Europe. One of the varieties proved to be a seedless grape. From this he took cuttings and set out a large vineyard, which came into bearing before anyone knew he had a seedless grape.

Good Roads

A delegation from the American Automobile Association appeared before the joint committee, of which Senator Jonathan Bourne, Jr., is chairman, to express their willingness to co-operate along lines which would safeguard the use of federal money and assure tangible, real and personal results in the way of good roads. The association believes in the principle of state aid state highway systems. The automobile certainly is a very evident factor in the movement for better roads. Hon. Allen Barclay of Kentucky says, "Nothing would conduce more to prosperity and happiness of our people than a general system of improved highways, and I am convinced that if this result is to be brought about the national government should co-operate with the states in permanent improvement of their roads." A fruitgrower probably takes as great, if not greater, interest in good roads than any other class of farmers, for the reason that fruit must be laid down at the depot in first-class condition, without bruising, and fruit cannot be hauled over miserable roads without more or less damage. Fruitgrowers as a class stand for better roads. Various opinions exist among them as to state highways, government aid and state aid. Generally speaking fruitgrowers are favorable to highways, but the interest is great in the development of the roads in the particular section over which each of the fruitgrowers must haul his stuff to the railway depot.

Editor Better Fruit:

I wish to congratulate you on your small fruit issue. Though it didn't once mention them that I noticed, it was a "peach." Yours truly, Chas. E. Wise, Grants Pass, Oregon.

Northwest Fruit Growers' Unions and Associations

We publish free in this column the name of any fruit growers' organization. Secretaries are requested to furnish particulars for publication.

Oregon

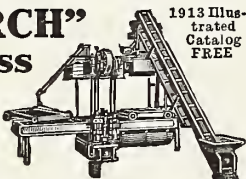
Albany Fruit Growers' Union, Albany.
Ashland Fruit and Produce Association, Ashland.
Benton County Fruit Growers' Association, Corvallis.
Brownsville Fruit and Produce Association, Brownsville.
Coos Bay Fruit Growers' Association, Marshfield.
Coville Valley Fruit Growers' Union, Myrtle Point.
Cove Fruit Growers' Association, Cove.
Dallas Fruit Growers' Association, Dallas.
Douglas County Fruit Growers' Association, Roseburg.
Dufur Valley Fruit Growers' Union, Dufur.
Dundee Fruit Growers' Association, Dundee.
Dundee Co-operative Fruit Growers and Packers, Dundee.
Estacada Fruit Growers' Association, Estacada.
Eugene Fruit Growers' Association, Eugene.
Hood River Apple Growers' Union, Hood River.
Hyland Fruit Growers of Yamhill County, Sheridan.
Imbler Fruit Growers' Union, Imbler.
La Grande Fruit Association, La Grande.
Lincoln County Fruit Growers' Union, Toledo.
McMinnville Fruit Growers' Association, McMinnville.
Milton Fruit Growers' Union, Milton.
Mosier Fruit Growers' Association, Mosier.
Mount Hood Fruit Growers' Association, Sandy.
Newburg Apple Growers' Association, Newburg.
Northwestern Fruit Exchange, 418 Spalding Bldg., Portland.
Northeast Gaston Farmers' Association, Forest Grove.
Oregon City Fruit and Produce Association, Oregon City.
Rogue River Fruit and Produce Association, Medford.
Salem Fruit Union, Salem.
Santiam Fruit Growers' Association, Lebanon.
Springbrook Fruit Growers' Union, Springbrook.
Stanfield Fruit Growers' Association, Stanfield.
Sutherlin Fruit Growers' Association, Sutherlin.
The Dalles Fruit Growers' Union, The Dalles.
Umpqua Valley Fruit Growers' Association, Roseburg.
Washington County Fruit Growers' Association, Hillsboro.
Willamette Valley Prune Association, Salem.

Washington

Apple Growers' Union of White Salmon, Underwood.
Bay Island Fruit Growers' Association, Tacoma.
Brewster Fruit Growers' Union, Brewster.
Buckley Fruit Growers' Association, Buckley.
Cashmere Fruit Growers' Union, Cashmere.
Clarkston Fruit Growers' Association, Clarkston.
Cowlitz Fruit and Produce Association, Kelso.
Dryden Fruit Growers' Union, Dryden.
Elma Fruit and Produce Association, Elma.
Felida Prune Growers' Association, Vancouver.
Garfield Fruit Growers' Union, Garfield.
Goldendale Fruit and Produce Association, Goldendale.
Grandview Fruit Growers' Association, Grandview.
Granger Fruit Growers' Association, Granger.
Kalama Fruit Growers' Association, Kalama.
Kennewick Fruit Growers' Association, Kennewick.
Kiona Fruit Growers' Union, Kiona.
Lake Chelan Fruit Growers' Association, Chelan.
Lewis County Fruit Growers' Association, Centralia.
Lewis River Fruit Growers' Union, Woodland.
Mason County Fruit Growers' Association, Shelton.
Mount Vernon Fruit Growers' Association, Mount Vernon.
Northwestern Fruit Exchange, 510 Chamber of Commerce Building, Spokane.
Peshastin Fruit Growers' Association, Peshastin.

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Spokane Inland Fruit Growers' Association, Kellogg.
Spokane Valley Fruit Growers Co., Otis Orchards.
Spokane Valley Growers' Union, Spokane.
Southwest Washington Fruit Growers' Association, Chehalis.
Stevens County Fruit Growers' Union, Myers Falls.
The Green Bluffs Fruit Growers' Association, Mead.
The Ridgefield Fruit Growers' Association, Ridgefield.
The Touchet Valley Fruit and Produce Union, Dayton.
Thurston County Fruit Growers' Union, Tumwater.
Vashon Fruit Union, Vashon.
Walla Walla Fruit and Vegetable Union, Walla Walla.
Wenatchee District Fruit Growers' Union, Wenatchee.
Wenatchee Valley Fruit Growers' Association, Wenatchee.
White River Valley Fruit and Berry Growers' Assn., Kent.
White Salmon Fruit Growers' Union, White Salmon.
Yakima Valley Fruit Growers' Association, North Yakima.
Yakima Valley Fruit and Produce Growers' Assn., Granger.
Yakima County Horticultural Union, North Yakima.
Zillah Fruit Growers' Association, Toppenish.

Idaho

Boise Valley Fruit Growers' Association, Boise.
Caldwell Fruit Growers' Association, Caldwell.
Council Valley Fruit Growers' Association, Council.
Emmett Fruit Growers' Association, Emmett.
Fruit Growers' Association, Moscow.
Lewiston Orchards Assembly, Lewiston.
Lewiston Orchards Association, Lewiston.
Nampa Fruit Growers' Association, Nampa.
New Plymouth Fruit Growers' Association, New Plymouth.
Parma-Roswell Fruit Growers' Association, Parma.
Payette Valley Apple Growers' Union, Payette.
Southern Idaho Fruit Shippers' Association, Boise.
Twin Falls Fruit Growers' Association, Twin Falls.
Weiser Fruit and Produce Growers' Association, Weiser.
Weiser River Fruit Growers' Association, Weiser.

Colorado

Boulder County Fruit Growers' Association, Boulder.
Capital Hill Melon Growers' Association, Rocky Ford.
Crawford Fruit Growers' Association, Crawford.
Delta County Fruit Growers' Association, Delta.
Denver Fruit and Vegetable Association, Denver.
Fair Mount Melon Growers' Association, Swink.
Fowler Melon Growers' Association, Fowler.
Fremont County Fruit Growers' Association, Canon City.
Granada Melon Growers' Association, Granada.
Grand Junction Fruit Growers' Association, Clifton, Palisade, Grand Junction.
Kouns Party Cantaloupe Growers' Association, Rocky Ford.
Lamar Melon Growers' Association, Lamar.
Longmont Produce Exchange, Longmont.
Loveland Fruit Growers' Association, Loveland.
Manzanola Fruit Association, Manzanola.
Manzanola Orchard Association, Manzanola.
Montrose Fruit and Produce Association, Montrose.
Newdale Melon Growers' Association, Swink.
Palisade Fruit Growers' Association, Palisade.
Paonia Fruit Exchange, Paonia.
Pent County Melon Growers' Association, Las Animas.
Produce Association, Debeque.
Rifle Fruit and Produce Association, Rifle.
Roaring Fork Potato Growers' Association, Carbondale.
Rocky Ford Melon Growers' Association, Rocky Ford.
San Juan Fruit and Produce Growers' Assn., Durango.
The Producers' Association, Debeque.
Western Slope Fruit Growers' Association, Palisade.

Montana

Bitter Root Fruit Growers' Association, Hamilton.
Missoula Fruit and Produce Association, Missoula.
Woodside Fruit Growers' Association, Woodside.

Utah

Bear River Valley Fruit Growers' Assn., Bear River City.
Brigham City Fruit Growers' Association, Brigham City.
Cache Valley Fruit Growers' Association, Wellsville.
Centerville Fruit Growers' Association, Centerville.
Excelsior Fruit and Produce Association, Clearfield (post-office Layton).
Farmers and Fruit Growers' Forwarding Assn., Centerville.
Green River Fruit Growers' Association, Green River.
Ogden Fruit Growers' Association, Ogden.
Springville Fruit Growers' Association, Springville.
Utah County Fruit and Produce Association, Provo.
Willard Fruit Growers' Association, Willard.

California

California Farmers' Union, Fresno.
California Fruit Exchange, Sacramento.
Fresno Fruit Growers' Company, Fresno.
Lincoln Fruit Growers' Association, Lincoln.
Lodi Fruit Growers' Union, Lodi.
Loomis Fruit Growers' Association, Loomis.
Newcastle Fruit Growers' Association, Newcastle.
Penryn Fruit Growers' Association, Penryn.
Sebastopol Apple Growers' Union, Sebastopol.
Sebastopol Berry Growers' Union, Sebastopol.
Stanislaus Farmers' Union, Modesto.
The Supply Company of the California Fruit Growers' Association, Los Angeles.
Turlock Fruit Growers' Association, Turlock.
Vacaville Fruit Growers' Association, Vacaville.
Winters Fruit Growers' Association, Winters.

New Mexico

San Juan Fruit and Produce Association, Farmington.

British Columbia

Armstrong Fruit Growers' Association, Armstrong.
Bowwell-Kootenay Lake Union, Bowwell.
British Columbia Fruit Growers' Association, Victoria.
Creston Fruit and Produce Exchange, Creston.
Grand Forks Fruit Growers' Association, Grand Forks.
Hammond Fruit Association, Ltd., Hammond.
Hatzie Fruit Growers' Association, Hatzie.
Kaslo Horticultural Association, Kaslo.
Kelowna Farmers' Exchange, Ltd., Kelowna.
Kootenay Fruit Growers' Union, Ltd., Nelson.
Mission Fruit Growers' Association, Mission.
Okanagan Fruit Union, Ltd., Vernon.
Queens Bay Fruit Growers' Association, Queens Bay.
Salmon Arm Farmers' Exchange, Salmon Arm.
Summerland Fruit Growers' Association, Summerland.
Victoria Fruit Growers' Exchange, Victoria.
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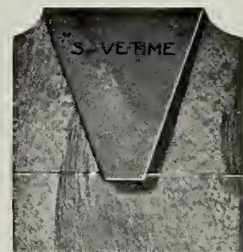
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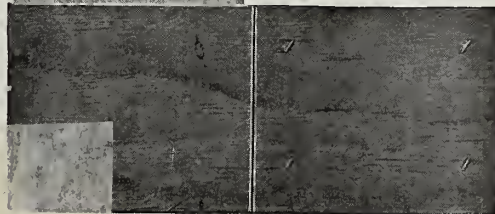
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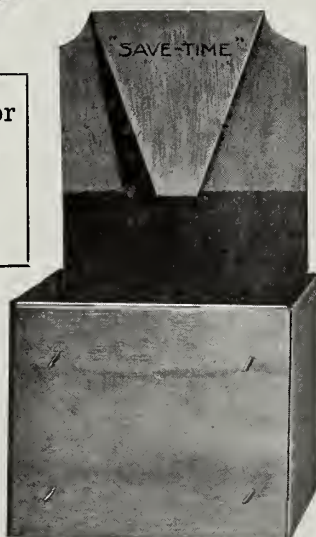
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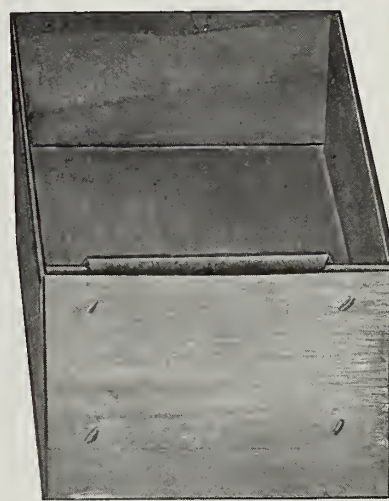
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